INDIGENOUS WILDCATTERS, CLANDESTINE PROSPECTORS OF THE PETROLEUM WORLD : AN EXPLORATORY STUDY OF BRITISH INDEPENDENT EXPLORATION AND PRODUCTION COMPANIES

Torcail M. Stewart

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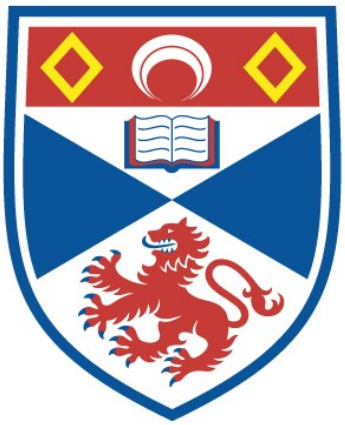
University of St Andrews



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Indigenous Wildcatters, Clandestine Prospectors of the Petroleum World:

An Exploratory Study of British Independent Exploration and Production Companies

by

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ABSTRACT

This thesis explores the organizational strengths and competitive strategies exhibited by British Independent Petroleum Exploration and Production Companies. Fieldwork methods were used to obtain new primary source data (quantitative and qualitative) on these companies. These were gathered through a series of semi-structured face-to-face interviews with fourteen Independents, representing a large component of the population and seven international drilling contractors. The research topic is developed along four principal channels of inquiry: 1) *Strategic Decision-making Speed and Rapidity of Action,* 2) *Utilisation of Contractors* 3) *Negotiation* 4) *International Strategy.*

The main organizational strength is identified as the ability of the Independent to be fast in its decision-making speed. In explaining this finding, a range of structural variables are investigated, and shown to be of potential influence. Further, the in-house functional strengths possessed by Independents are examined, and differing reasons for their internalisation are delineated. Another organizational strength is shown to lie in the less formalized approach to business deals adopted by Independents. In particular, the emphasis which Independents place upon developing relationships is found to fit the 'non-ideal' operating disposition of Non-Western government bureaucracies.

It is shown that, being free of the inertia which may induce formalized systems and bureaucratic controls in larger firms, the Independent cultivates more flexible systems, which foster its manoeuvrability. A potentially fruitful competitive strategy recognised for such firms is found to be their ability to seize windows of opportunity, in terms of concluding deals. Being small and of limited resources, the international strategy exhibited by several Independents is shown to be one which builds upon existing capabilities. As a consequence, countries where existing company knowledge and experience can be most readily applied, are targeted. Indeed, some Independents' capabilities appear to reside in operating in high political/corruption risk countries. In entering countries often avoided by larger competitors, Independents may reasonably be characterised as clandestine prospectors of the petroleum world.

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DECLARATIONS

I, Torcail Stewart, hereby certify that this thesis, which is approximately 44,000 words in length, has been written by me, that it is the record of work carried out by me and that it has not been submitted in any previous application for a higher degree.

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PART 1 KEY CONCEPTS AND FRAMEWORK

1. INTRODUCTION

1.1 The Areas of Inquiry

Situated within the context of growing research into Small and Medium sized Enterprises (SMEs), this study focuses upon a particular set of companies that traditionally have received minimal attention from the research fields of Management, Economics, or International Relations. These firms are the 'Independent' exploration and production petroleum companies. Positioned in an industry often characterised for its large, 'Major' sized enterprises, the Independents are shown in this study to act as a novel research vehicle for revealing the organizational strengths and competitive strategies, that can be deployed by smaller firms.

An 'Independent' is defined in this study as a company with its predominant focus upon petroleum exploration and production (see Section 2.1). Independents have traditionally been distinguished from the larger Majors through not being vertically integrated; Independents do not possess a 'global system of production, transport, refining and marketing.' (Sampson, 1975, p.143)[1].

A paucity of research towards Independents[2] dictated an exploratory approach. In accordance with the writings of Ragin (1994, p.47) this thesis embraces the concept that social research should involve the simultaneous interplay of both inductive and deductive methods. The research findings emanate from a series of semi-structured, face-to-face interviews conducted by the author with fourteen British Independents between December 2003 and April 2004. The design of the accompanying interview questionnaire incorporated both inductive and deductive aspects. It explores along four primary channels of inquiry, the organizational strengths and competitive strategies

[1] Deviating from Landeau's (1977) 'operational defintion', this study does not restrict Independents purely to those operating internationally. Non-international domestic enterprises offer valuable insight into the origins and spectrum of business models that constitute the Independent sector and therefore have been included.

[2] To the author's knowledge only two pieces of academic research have ever specifically targeted 'Independents'. The first is McKie, J.W. (1960) 'Market Structure and Uncertainty in Oil and Gas Exploration' *The Quarterly Journal of Economics* Vol. 74 , No. 4, 543-571. The second is Landeau, J-F. G. (1977) *Strategies of US Independent Oil Companies Abroad* UMI Research Press, Michigan.

which Independents can leverage. These channels, derived as a consequence of initial inductive research, are 1) *Strategic Decision-making Speed and Rapidity of Action, 2) Utilisation of Contractors 3) Negotiation 4) International Strategy.* To enhance the comprehensiveness of the study, North American Independents were incorporated via a postal questionnaire. The twelve responding North American Independents assisted in both raising the sample size and permitting, on occasion, a comparison to be drawn with the British Independents. Further, to corroborate Independents' responses through 'triangulation' (Yin, 1994; Punch, 1998)[3], a series of face-to-face semi-structured interviews were undertaken with seven International Drilling Contractors.

1.2 1) Strategic Decision-making Speed and Rapidity of Action

This area of inquiry was based upon the House of Commons Energy Committee 1988 reports on the 'The UK Independent Oil Sector'. One conclusion posited by the Committee's First and Second reports was that Independents were rapid in their decision-making and action. From the Second report 'Independent companies may be able to move more swiftly than their Major competitors...and take quick decisions' (HCSC, 1988a, p.viii). It was suggested that decision-making speed was structurally determined, there being 'a short path from idea to execution, rather than stifled by layers of bureaucratic management' (Tricentrol, 1988, p.53). Furthermore, Independents were reported to 'move quickly' as a consequence of the 'financial pressures' they faced (HCSC, 1988a, p.vii). To test and develop hypotheses suggested by these reports (Section 3.1), this thesis draws from specialist research on strategic decision-making speed (Bourgeois and Eisenhardt, 1988; Eisenhardt, 1989; Eisenhardt, 1990; Judge and Miller, 1991; Wally and Baum, 1994) to formulate a novel set of exploratory research questions specific to Independents. Some of the key questions explored were (Sections 3.1, 5.3, 6.1):

- For which operations are the differentials in decision-making speed between Independents and Majors greatest?

[3] 'Triangulation' is the process by which existing findings can receive further validation through conducting a separate study that approaches the same queries from a different direction or source (Punch, 1998, p.247).

- Do structural variables, such as the number of personnel consulted for a given decision (Spectrum of Consultation), or the level of focus exhibited by the key decision-maker, influence decision-making speed? Furthermore, does either of these variables alter in accordance with firm size?
- Assuming rapid decisions are made by Independents, what is the quality of the final decision made?
- What are the pressures that stimulate Independents to act quickly? Are 'financial pressures,' such as the cost of capital, the fundamental stimulus?
- Can the time taken for particular actions be measured?

In tackling these research questions, the most powerful method, given small samples, is to look at extremes; Major vs. Independent. Indeed, such comparison was attempted. However, insufficient Majors were willing to participate in this research for quantitative comparisons to be made[4]. Incorporation of the seven International Drilling Contractors surmounted this obstacle. Qualitative results, obtained from the impartial Drilling Contractor interviewees, serve usefully to 'triangulate' and confirm the decision-making speed differential observed to exist between Majors and Independents. Beyond the Majors vs. Independents comparison, the quantitative and qualitative results collected present opportunity for reflection on the actions within the Independent population itself. Relative to decision-making speed, rapidity of action, and other areas of inquiry, larger sized Independents may exhibit characteristics that differ from those of smaller Independents. Such differences are likely to be more difficult to detect than for the Major / Independent comparison, due to the smaller absolute difference in features between firms in the Independent population. Nevertheless, should size-based differences in decision-making speed be displayed for Independents, as is the finding (Section 6.1), this would emphasise the primary role that firm size plays.

1.3 2) Utilisation of Contractors

Drawing from Richardson's (1972, p.231) resource-based concept of 'capability' and Williamson's transactions cost economics (1975; 1985; 1986; 1989; 2002), this second

[4] Only three of the Majors contacted were willing to be interviewed.

area of inquiry[5] (Section 3.2, 5.4, 6.2), seeks to determine and analyse the particular in-house functions provided by Independents. Richardson's and Williamson's alternative schemata are each utilised to explain the sourcing of various functions. With both schemta shown to be capable of application (Section 6.2.1 & 6.2.4), reconciliation of the differing models may be analysed from the perspective of a firm's process of internalising new functions (Section 6.2.5). Nevertheless, whilst reconciliation may be established for this aspect, it is shown not to be possible for all. Williamson's concept of 'opportunism' is diametrically opposite to Richardson's 'co-operation'. As demonstrated (Section 6.2.7-8) analysis of British Independents' incentivisation procedures may be used to test the validity of both concepts.

1.4 3) Negotiation

Strength in negotiations is noted as a feature central to Independents' abilities to 'cultivate their connections' with foreign governments (Economist, 1998, p.34). Emphasis is placed upon the low turnover of managers within Independents, as a primary element in successful relations with host nations. They report the seniority of Independents' negotiating personnel to confer advantage; 'politicians in developing countries sometimes prefer to deal with the boss of an Independent than a mere manager of an oil giant.' (Economist, 1998, p.34). Such proposed strengths all pertain to what this thesis will term negotiating *approach factors* (Section 3.3); these are the methods used to channel firms' efforts to achieve advantageous positions from which to proceed to the final bargaining stage. This study tests the two proposed Independent approach strengths, *seniority of company representatives* (Kapoor et al, 1991; Marsh, 2001) and *low turnover of company representatives* (Ring and van de Ven, 1992; Child, 1998; Yoshino and Rangan, 1995; Kelly et al., 2000; Salacuse, 1991), relative to other approach factors. Whilst *approach* is the method, negotiation must have substance; the work proposed by a firm to be undertaken is referred to in this thesis as *content*. The *content* of an Independent's exploration proposal to a host nation, is the technical action that will be implemented by a firm. The relative influence of *approach* and *content* factors may

[5] This was incorporated following the recommendation of Professor Kemp, University of Aberdeen. He regarded Independents "use of contractors to be key" to their functioning.

vary according to the negotiating *context* in which they are applied (Section 3.3). In this research, *context* relates to the licensing authorities of differing host governments with whom Independents engage. The current research aims to determine the typical *approach* and *content* strengths which Independents typically leverage and to which *contexts* they are most applicable (Sections 3.3, 5.5 and 6.3). Whilst focused upon the Independents, this research may be considered, in a broader context, as seeking to initiate further consideration of the strengths SMEs in general can leverage in negotiation scenarios. It appears this aspect has been neglected in existing SME literature.

1.5 4) International Strategy

A characteristic of the current British Independent is that the majority hold no petroleum licences in Britain; they are international in their operations[6] (Sections 3.4, 5.6 and 6.4). Landeau's (1977) published Harvard PhD thesis specifically focused on the rationale for US Independents seeking to internationalise. Following a similar qualitative analysis to Landeau, this research probes whether the principal internationalising factors identified by Landeau also hold for British Independents' first international move. Since initial inductive research reported that countries entered by Independents were 'basket-cases' (Analyst A, 2003), this thesis also seeks to determine the predominant reason given for country choice (Johanson and Vahlne, 1977; Johanson and Wiedersheim-Paul, 1975). The Independents' *ability* to operate in 'basket-case' countries may indeed be a source of competitive strength rather than weakness. Unlike Landeau, this research also incorporates the non-international Independents, and seeks to determine the validity of their reasoning for not internationalising. Finally, following Miles and Huberman's (1994) recommendation, the differing international orientation of Independents is categorised into 'families' of business models, and justification for their separate designs is sought.

[6] For this thesis the term 'international' is understood as applicable to any firm that undertakes licence interests in two or more countries.

1.6 The Necessity of Fieldwork

Despite its significance to world economies, there have been 'in reality...relatively few academic economists interested in the international oil industry' (Stevens, 1995, p.129). The cause of this limited interest is reported to be due to a lack of data. The 'extremely secretive' nature of the oil industry has traditionally prevented sufficient data becoming available, on which theories could be tested (Stevens, 1995, p.129). In accordance with Stevens (1995, p.137), this thesis overcomes the 'great danger in economics that only that which can be put into an equation is considered', to explore a set of companies neglected by both economics and the wider social sciences. This research seeks solution to data limitation, through direct fieldwork, using company interviews. The history of economic analysis was originally grounded in fieldwork; as Reid (1993, p.6) reports, both Adam Smith and Alfred Marshall held strong concern for the 'realities of business activity'. Economic inquiry must challenge the neglected frontiers, for it is often in these disregarded areas where such research is required most.

Set within the inter-disciplinary framework of Management, Economics, and International Relations this thesis employs a broad set of conceptual tools in its exploratory analysis of the British Independent Exploration and Production Companies.

2. POPULATIONS INVESTIGATED

2.1 The US Population – McKie's (1960) Study

Apart from Landeau's (1977) targeted research into US Independents' moves abroad[1], the only recorded research broadly investigating Independents' positioning relative to Majors, was initiated by James McKie (1960) in the *Quarterly Journal of Economics.* McKie focused on Independents exploring within the US. From his analysis of exploration success rates in the American Association of Petroleum Geologists' statistical data set, he derived interesting conclusions[2]:

1. Majors drill most of the expensive, deep exploration wells. Independents favour ventures with lower initial outlay (McKie, 1960, p. 552).
2. Uncertainty, in the sense of Knight (1921), places exploration success rates of Independents and Majors on an even footing: 'while the major companies, by and large, have better access to superior prospects, they cannot identify the superior chances with certainty simply by spending money on exploratory work. Their information is far from perfect. In some cases the small company's information may be as good as, or no worse than, that of a large corporation.' (McKie, 1960, p.559). Inadvertent support may be noted in contemporary writings. For example, Masseron (1990, p.17) states 'uncertainty' to prevail, 'all the methods employed provide only a general ideal of the structure of the subsurface.'

McKie also summarised received industry wisdom regarding US Independents that proliferated at the time[3].

1. 'Independents congregate in *areas* where the relative advantages of the Major firms are weakest' (McKie, 1960, p.570).
2. '[Independents] take advantage of flexibility and speed in detecting and seizing available opportunities in these *areas*' (McKie, 1960, p.570).

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[1] In spite of Landeau's (1977) extended literature review, it appears he was not aware of McKie's (1960) article, for no reference to it is made by Landeau.

[2] Unfortunately, an equivalent contemporary data set is no longer compiled by the American Association of Petroleum Geologists. Forbes and Zampelli's (2000; 2002) use of the Energy Information Administration (EIA) data set is the best currently available, although this only includes the largest Major US producers.

[3] McKie did not reference these conclusions to any direct evidence, thus their general validity should be questioned.

3. 'Independents do not try to operate extensively with limited resources, but specialize in restricted *areas* which they can study intensively.'(McKie, 1960, p.570)[4].

Without empirical validation, the above must be treated with caution. They also pertain only to the operations of Independents in one country, namely the United States. British Independents are mainly international in their operation: an equivalent to the old US Independents' geographic 'areas' of focus might be the British Independents' focus on particular 'countries'. Section 6.4 explores this question.

No subsequent research has developed McKie's findings. The organizational strengths and competitive strategies that Independents can seek to leverage remain undisclosed. This thesis addresses this deficiency, through an examination of the British Independents.

2.2 The British Population

The Independent population recognised for this research constitutes those British and Irish Exploration and Production (E&P) companies listed on the London Stock Exchange (LSE) as of the 31st October 2003[5]. A market capitalization of £10m was set as the threshold level necessary for inclusion in the population; analysis of company web-sites and annual reports determined that the few firms below this threshold did not currently hold active licence interests. In total twenty-one publicly quoted[6] companies were found to fit our Independent 'unit of analysis'[7]. Table 2.2.1 displays the population of twenty-one Independents, the focus of this thesis[8].

[4] *Italics* are plain text within McKie's (1960) article.
[5] Since only two of the Independents in the population were Irish registered, Aminex and Dragon Oil, the Independent population sampled are forthwith referred to as British Independents.
[6] Private companies such as Reach Exploration & Tuscan were not included in the population. This was because Companies House data did not accurately specify 'nature of business' (SIC 92). E&P companies were sometimes detailed under the following categories 'Other service activities', 'Holding company', 'Other business activities'. Unable to source an accurate listing of private E&P firms from either the DTI, or Companies House, private firms are not included in this study.
[7] (Collis and Hussey, 2003, p.121)

British Publicly Listed Exploration & Production Companies	
Company	*Market Capitalization (£m)*
Pan Andean Resources	10.41
Northern Petroleum	10.42
Global Energy Development	12.73
Desire Petroleum	14.37
Aminex	19.90
Emerald Energy	22.36
Regal Petroleum	48.54
Edinburgh Oil & Gas	53.25
JKX Oil & Gas	57.81
Sterling Energy	60.81
Melrose Resources	81.68
Ramco Energy	99.87
Dragon Oil	124.94
Venture Production	132.04
Dana Petroleum	168.32
Soco International	216.60
Sibir Energy	259.44
Paladin Resources	295.44
Premier Oil	295.61
Tullow Oil	319.58
Cairn Energy	583.75
Listed at 31/10/03 on the LSE	

Table 2.2.1

3. LITERATURE REVIEW

3.1 STRATEGIC DECISION-MAKING SPEED & RAPIDITY OF ACTION

3.1.1 Introduction

Received wisdom within the industry (HCSC,1988a; Investment AnalystA), is that Independents are fast moving in the speed and action of decision-making. For this industry, neither attribute has been systematically verified academically (Section 1.1). The few papers to have investigated decision-making speed have predominantly focused upon high-velocity environments, mainly industry sectors where changes in demand, technology and competition are so fast, and discontinuous, that the existing information available to a firm is rapidly rendered obsolete (Bourgeois and Eisenhardt, 1988; Eisenhardt, 1989; Eisenhardt, 1990). Progressing the research agenda beyond high-velocity environments has been started (Judge and Miller, 1991; Wally and Baum, 1994), and the current study aims to take this movement further.

3.1.2 Contemporary Research

Strategic decision-making relates to 'decisions that involve the commitment of substantial resources at the level of the total enterprise.' (Wally and Baum, 1994, p.933). As typical exploration drilling-costs approximate £5-10m (Masseron, 1990, p.123), most drilling decisions are of strategic magnitude to the Independent firm[1]. The modern foundations to investigating strategic decision-making speed may be found in Eisenhardt's inductive, case-study based research upon eight microcomputer firms (Eisenhardt, 1989). Establishing a preliminary hypothesis of the relationship between rapid decision-making and firm performance (Bourgeois and Eisenhardt, 1988), the expanded research contemplated a broad set of influential variables. Key findings suggested that fast decision-makers accelerate their decision choice by: considering multiple alternatives, using real time information, utilising experienced counsellors, resolving conflicting opinions, and prioritising the extent to which decisions may be integrated (Eisenhardt, 1989). Judge and Miller (1991) attempted to test Eisenhardt's findings within the differing velocity environments of biotechnology (n=10), hospitals

[1] The mean Turnover for the 21 Independents in 2002 was only £42.04m: one £10m exploration drilling would require 24% of Turnover (Section 5.1).

(n=12) and textiles (n=10). Decision-making speed was mainly found to be strongly associated with the consideration of multiple simultaneous alternatives within the high velocity biotechnology sector ($p < 0.05$), but not for hospitals or textiles.

Part of Eisenhardt's (1989) study involves categorizing various techniques reported as being employed by fast decision-making firms. In contrast to the present work, her article does not report on the structure of firms, in terms of the centralization or formalization of decision-making, and their roles as notable determinants of decision-making speed. Her relative lack of findings could be a consequence of the type of firm she studied. Thus microcomputer firms, operating in high velocity environments, seem to approximate closely to Mintzberg's (1979) 'adhocracy'. Operating in dynamic and complex environments, authority within the adhocracy is decentralized in structure. In order to innovate, creatively functioning teams are predominant, and centralized authority is minimal (Mintzberg, 1981). This suggests that Eisenhardt's (1989) findings should not be extrapolated to lower velocity environments without caution, for structural determinants are found to have an important influence on decision-making speed in these environments (Wally and Baum, 1994).

A further cause of Eisenhardt's neglect of structural variables is her conflation of the numbers of personnel consulted, with the number of alternatives generated. Eisenhardt (1989) criticises the previous work of March and Olsen (1981) and Janis (1982), for suggesting that consideration of more alternatives slows down decision-making. However, she fails to recognise the additional feature at play in these works, in that they emphasise the importance of the number of personnel consulted. Whilst her findings do demonstrate the importance of considering multiple, simultaneous alternatives on speed of decision making, they in no way probe the number of personnel involved within the consultation process. The formulating of multiple alternatives to a problem, is a task that can be undertaken by any team, regardless of its size. Considering multiple alternatives appears very similar to a scenario planning methodology[2]. Whilst utilisation of multiple

[2] An often noted example of scenario planning was Shell's preparation for a possible oil price collapse, which did occur in 1986. (Howarth, 1997, p.349).

alternatives may enhance the speed of decision-making, this cannot be extrapolated to refute the structural organisational feature that the more personnel consulted, the slower the decision. A range of differing personnel can be consulted out of necessity; and information may need to be gathered from various personnel for a decision to be well informed. Judge and Miller (1991) did not find *consideration of multiple simultaneous alternatives* to be associated with decision-making speed in the low velocity environments of textiles or hospitals. It could be argued that alternative causal mechanisms should be sought for these lower velocity environments, and one such alternative, to be investigated in this thesis, is the effect that the number of personnel consulted for a given decision has on decision-making speed.

In contrast to Eisenhardt, emphasising decision-speeding techniques[3], Wally and Baum (1994) acknowledge the importance of structural determinants on decision-making speed. Wally and Baum's (1994) survey of 151 Pennsylvanian manufacturing companies probes a wide set of variables of both *personal*[4] and *structural* origin. These include the *personal* determinants of cognitive ability, intuition, tolerance of risk, propensity to act, as well as the *structural* determinants, such as centralization and formalization. Their findings show that the greater the risk propensity, optimism, flexibility, and use of intuition by the CEO, the faster is the decision-making speed. Further, the greater the centralization, and the lesser the formalization within the organisation, the slower is the decision-making speed. Firm size, measured according to turnover and total number of employees, was adopted as a measure of firm complexity. Both measures were found to be inversely correlated with decision-making speed. Further, the larger the firm, the slower the decision-making speed.

Overall, the emphasis of Wally and Baum's (1994) study is on the individual economic agent. This is partly a consequence of their methodology. In their case, only CEOs were used as respondents. However, this constraint on interviewee was a luxury that could not

[3] Eisenhardt's (1989) findings tend to focus upon the particular tactics and methods that any firm can adopt to speed decision-making.
[4] Wally and Baum (1994) adopt the terminology of 'personal', to refer to the individual agent. In their study the agent is the CEO.

be afforded in the one year study of this thesis, as the industry is noted for its inaccessibility (Stevens, 1995, p.129). Moreover, some of Wally and Baum's (1994) approaches to assess the individual respondent, such as a Bieri grid for cognitive complexity[5], have the underlying assumption that the individual is wholly representative of the organization. Simple Likert scales are used for the CEO to assess the level of centralization within the organization. Whilst necessary for their highly diverse firm population, in order to achieve common comparison, this thesis, being focused on one set of firms within an industry, can probe into more specific and complex information. The neglect in the literature of the actual numbers and positions of personnel consulted for a given decision needs to be rectified. March and Olsen's (1981) finding, that the number of personnel consulted may extend the decision-making process, requires more empirical examination than it has hitherto received.

Wally and Baum (1994) do not unpack the size of firm / complexity variable. Although they state that larger firm size is accompanied by greater organizational complexity, they do not explain the nature of complexity. In this thesis, it is reasoned that, within organizations, information search-costs exist. Such costs may be measured specifically in the time taken to gather all the relevant information necessary to deliver an informed decision. Since the required information is typically generated by individual personnel - through application of their particular skills, knowledge, and experience - for a decision to be well informed, a range of individuals will have to be consulted. It may be that the greater the number of personnel who hold the necessary information, the longer will be the time taken to gather the information from them. As Olsen (1981, p.135) notes 'the greater the number of...participants activated, the longer the decision will take.' When firms increase in size, there is typically a move towards an increased division of labour

[5] This grid developed by Bieri et al. (1966, p.185) reasoned that any given individual's cognitive complexity (information processing skills) could be measured according to the level of discrimination exhibited in assessing an event. For Wally and Baum (1994) CEOs had to evaluate particular people they knew on a six-point scale over ten characteristics. Differences between ratings were summed to indicate the test-taker's range of evaluation. A high score indicated high discrimination in evaluation, and therefore high cognitive complexity of the respondent. Such a practice was not adopted in this thesis for two reasons. Firstly, Wally and Baum (1994, p.945) did not find cognitive complexity to significantly influence decision-making pace. Secondly, access to Independent's CEOs was not necessarily assured: often interviews could only be arranged with Technical Directors.

(Reid, 1989). Mintzberg (1981) notes the propensity of larger firms to engage in horizontal specialization[6]. Whilst this specialization may create efficiencies for the processing of day-to-day routine work, such efficiencies may not necessarily hold for non-routine, strategic decisions. They are typically of a much greater magnitude, and require the simultaneous assimilation and assessment of all the necessary information. Through reducing the scope of tasks constituted by an average job, work specialization spreads the necessary information across more individuals. The greater the specialization, the larger number of individuals require to be consulted to gather the necessary information for making an informed decision. This act of gathering information has a temporal cost. On the basis of the above discussion, the following are hypothesised:

3a) Hypothesis - The greater the number of personnel consulted to enact a given decision[7], the longer will be the time taken to choose a course of action.

3b) Hypothesis - The larger the firm size, the greater will be the number of personnel consulted for making a given decision.

3.1.3 Focus

An additional structural feature, neglected in existing studies, that may have an impact upon decision-making speed is the degree of *focus*. If the efforts of the ultimate decision-maker are spread over many projects, then the time taken for this decision-maker to become familiar with the details of each individual project, as and when it arises, is likely to be longer than for those decision-makers who preside over fewer projects. Within the industry examined in this thesis, this may be applied to the number of licence blocks that enter within the decision-making jurisdiction of a key manager. The view that there are boundaries to the *attention* a manager can give to any problem/task is supported by the research of Gifford (2001a; 2001b; 2001c). Her recognition that *overload*, that is, too many simultaneous projects, can result in poorer decisions, or decision delay, gives support to this thesis' investigation of focus. This suggests the following:

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[6] Horizontal specialization occurs when jobs within the organization increasingly encompass only a few narrowly defined tasks (Mintzberg, 1981).

[7] The number of personnel consulted to inform a decision is also referred to in this thesis as the 'spectrum of consultation'.

3c) Hypothesis – The greater the degree of focus of a key decision-maker in the organisation, the more rapidly will decisions be made.

3.1.4 Stimulus to Action

Although previous studies (Eisenhardt, 1989; Eisenhardt, 1990; Judge and Miller,1991) emphasise the importance of the (high-velocity) environment, the need for fast decisions is not always contingent upon the external environment. Rather, there can be an internal driver for speed. Lying in the small to medium sized enterprise (SME) category, yet operating in a sector characterised by extremely high costs (Masseron, 1990), British Independents are noted for their financial constraint. When time is costly, speed is of the essence. Thus one finds insiders making statements like:

'Sometimes, of course, it is the financial pressures which they face which will help the independents to move quickly – they need to push their partners to work expeditiously because they cannot afford to "tie up our capital in non-productive ways (Roland Shaw, Premier Oil)" ' (HCSC, 1988a, p.21).

To verify the above statement, this thesis investigates the financial pressure created by the use of debt. Is it the cost of capital (working its effect through the level of gearing) to a firm that stimulates Independents to act quickly? The burden of debt servicing and accompanying banking interest charges impose an additional cost arising from slow action. That is, the greater the time taken to repay the debt, the greater the amount of interest repayments required. Fast action may thus be stimulated in an effort to reduce the overall cost of debt. Not wishing to confine the investigation of possible stimuli to action to debt finance alone, this thesis, through particular question design, also permits alternative stimuli to action to be considered (see Section 5.3.2).

3.1.5 Measuring Action

The advantage of the current, context-specific investigation, is that an implemented action may be measured directly. Unlike previous studies, that have sought generality across industries (Judge and Miller,1991; Wally and Baum,1994), this thesis, through focusing on one industry, allows a generic action undertaken by all firms to be used as a yardstick of comparison. This new research establishes a question design framework for

measuring action that, once proven in the field, provides a template for extracting data from the historical records held by the UK Department of Trade and Industry (DTI). Such data would assist in testing more widely the following hypothesis, which our small sample investigation, at present, can only partially address. Moving downstream, from decision to action, these hypotheses question, generically whether Independents do move as 'swiftly' as the House of Commons Select Committee Reports have suggested (Section 1.1). Following Wally and Baum's (1994) finding that firm size influences decision-making pace, this thesis also tests whether a similar relation will hold between a firm's size and the speed at which a particular action is undertaken. In essence, do smaller firms implement their actions quicker than larger firms?[8] For this study, measurement of action relates to three key stages in the exploration of a particular licence holding. The *first* pertains to the licence award, that is, the point at which the host-nation grants permission for exploration to be undertaken. The *second* relates to the initial exploratory drilling action that is undertaken, namely the commencement of the first test well. Finally, following a successful exploration drilling, the *third* stage is the point at which the test-well discovery is brought on-line, and production commences[9]. The following hypotheses have therefore been proposed:

3d) Hypothesis - The smaller the Operating firm, the shorter the time between award of licence and drilling of the first exploration test-well.

3e) Hypothesis – The smaller the Operating firm, the shorter the time between a commercially successful exploration test-well find, and production coming on-line.

Acknowledging Eisenhardt's work, strategic decisions are of a magnitude of importance that speed must be accompanied by quality of decision-making. To control for this, a firm's past test-well drilling success rate has been used as a barometer for decision accuracy.

[8] Support is found in Chen and Hambrick's (1995) research. Their investigation of the US airline industry revealed small airlines to more rapidly action competitive challenges than large airlines.

[9] Following a successful exploration drilling, the firm must establish the appropriate production facilities and sales contracts prior to the commencement of production.

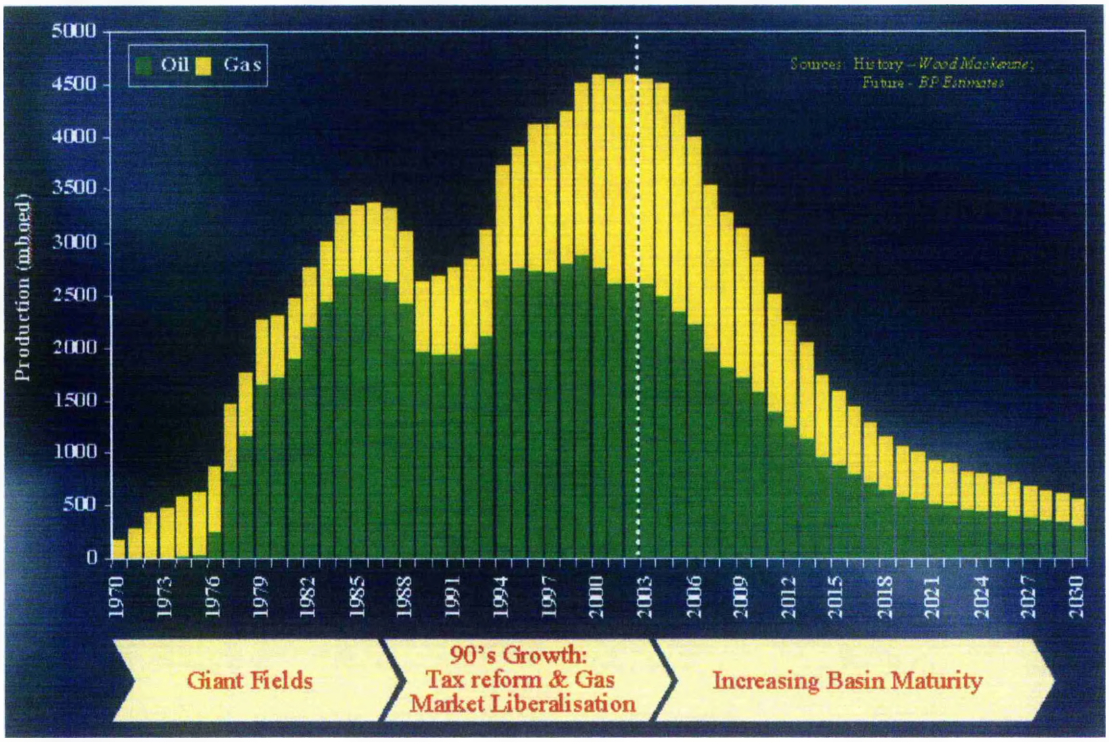
3.1.6 Rapidity of Action, a Growing Necessity for the UK Continental Shelf (UKCS)?

In the opening speech at the 2003 Offshore Europe Conference, Bruce Dingwall President of the United Kingdom Offshore Operators Association (UKOOA) referenced the evolving need for rapid action in the North Sea:

'It needs people and companies who are willing to take risks, who have the energy and are able to act and react with pace to a rapidly evolving basin and its unique and ever-challenging requirements.' (Dingwall, 2003)

The UKCS is increasingly recognised as a mature basin. Many now forecast total production to have reached its peak (Fig 3.1.1). Maturity is recognised within the industry as the final stage of a basin's life-cycle. The stage when it becomes increasingly difficult to find and produce petroleum. As reported for the North Sea, the "easy oil" has now been produced (Dingwall, 2003). With unit operating costs forecast to rise from \$4.1 per boe to \$4.9/boe by 2010, and the UKCS already seen as a high cost region, its international competitiveness is being questioned (UKOOA, 2003, p.8). Comparison is often made between the low cost Gulf of Mexico and the high cost UKCS.

Three Ages of the North Sea



Source: Skipper (2003)

Fig 3.1.1

An important element of the cost differential is typically attributed to behavioural factors. DTI Director, Simon Toole, notes the lengthy time taken to reach agreements, 'nine months in the UK...nine weeks in the Gulf', and the quantity of legal paperwork characteristic of UKCS contracts (Toole, 2003). The emerging objective of the DTI to encourage new Independent entrants from North America, is rationalised by saying that 'we need people successful from doing things in a different way' (Toole, 2003). As the 2003 roundtable workshop session at the Offshore Europe Conference concluded, for the UKCS: 'The pace of decision-making is too slow and much slower than in the Gulf of Mexico. This is largely a cultural issue – and down to 30 years of accreted practices!' (OER, 2003, p.10). Hastening decision-making speed is recognised as an important strategy for reducing costs within the UKCS. By establishing a framework to explore whether or not British Independents are fast moving and speedy decision-makers, this thesis will assess British Independents possible possession of such work practices.

3.2 UTILISATION OF CONTRACTORS

3.2.1 Introduction

The nature of business practice in the petroleum industry has traditionally been characterised by its large fully vertically integrated Major corporations (Sampson, 1975). In these corporations all five principal industry stages, of exploration, production, transportation, refining and marketing are internalised. For Majors, management of the entire cycle from initial crude extraction to final consumer sale can be provided in-house (Masseron, 1990; BP, 1977). In contrast, Independents are characterised by their lack of vertical integration. Their focus on the upstream exploration and production stages is a defining aspect of their operations (see Section 1.1). However, such focus does not imply that all the required functions for exploration and production are provided in-house by Independents. Initial unstructured, exploratory interviews suggested the opposite. Professor Kemp, University of Aberdeen, reported the Independents' "use of contractors to be key" to their functioning (Kemp, 2003). Thus, one research objective is to determine for which functions Independents rely on external contractors, as compared to the in-house functional strengths possessed by Independents.

3.2.2 The Nature of the Firm

Within economics literature, the issue of whether a firm provides a particular function internally, or whether it out-sources it to an external contractor, has received substantial attention. Ronald Coase (1937) posited that the cause of an action, such as whether a firm internally or externally sources a particular function, is essentially the consequence of there being a cost of using the price mechanism. This cost is, however, relative to the cost of internal provision. Coase's (1937) theory pivoted on the premise that a firm would seek in-house provision, if the cost of achieving this was lower than the cost of outsourcing the activity to an external provider (i.e. using the "price mechanism"). Whilst this transaction cost framework was useful for understanding the internal / external sourcing of functions, Coase did not fully explain what actually influenced the costs of internal provision. His efforts can be seen as mainly casting light on the extremes; the birth of firms and their final maturity. Thus, the establishment of a firm occurs because there is a cost of using the price mechanism; the high costs of negotiating

a separate contract for each transaction on the open market therefore makes it more profitable to develop internal provision. Coase's framework implies that firms have an automatic predisposition towards internalising new functions. They continue to grow and internalise more functions until a size is reached at which the costs of organizing an additional transaction internally are equivalent to outsourcing the transaction on the open market. In essence, Coase's schema prescribes that firms only move towards considering the possibility of outsourcing at the final stages of their growth. The theory does not sufficiently explain why the level of contractual sourcing varies from 'industry to industry and firm to firm' (Coase, 1937, p.73). This is because the factors determining the costs of internal provision, in the main, are only superficially explored by Coase. Subsequent work has explored what these costs of internal provision might entail[1]. Thus, in this thesis the writings of Oliver Williamson and George Richardson are used to provide two differing perspectives for interpreting what determines the in-house/out-house provision of functions among the Independents.

3.2.3 Transaction Cost Economics

Williamson's transactions cost economics primarily explains the sourcing of a company's functions through the concept of *Asset Specificity*. In relations between a buyer and seller *asset specificity* arises when gains from trade are made by investments in assets which are specialized to the exchange (Perry, 1989). For Williamson, it is the intensity of this specialization that determines whether internal or external provision is sought. The greater the specificity of an asset to a firm, the more likely that function will be internalised. Williamson (1986) identifies four types of asset specificity: *site specificity* (e.g. related to geographical proximity and asset immobility); *physical-asset specificity* (e.g. a particular die required to produce a component); *human-asset specificity* (e.g. learning-by-doing, or chronic problems of moving human assets in teams); *dedicated assets*, (e.g. involving the development of extra production capacity, but for the prospect of selling to a specific customer). Two additional factors that Williamson also notes as

[1] Within Williamson's work (1975; 1985; 1986; 1989; 2002) the cost of internal provision may be interpreted to be a function of asset specificity, uncertainty, and frequency of transaction. Whilst for Richardson (1972) the cost of internal provision is influenced by the fit ('similarity') of an activity with the existing knowledge, experience and skills held by the firm.

being of influence are *Uncertainty* and *Frequency of Transaction*. *Uncertainty*, relates to the disturbances to which a transaction is subject. *Frequency of Transaction*, relates to the rate at which transactions recur. As the power of either of these variables increases, the propensity to internalise the particular activity within the firm is augmented.

Williamson's transaction economics is stated to be based upon the concepts of *Bounded Rationality* and *Opportunism*. The theory of *Bounded Rationality* was developed by Herbert Simon (1961, p.xxiv), and conceived that economic actors were 'intendedly rational, but only limitedly so'. The formation of organizations was therefore a way to economise on the limited computational capacity of the individual (Simon, 1957, p.199). Drawing on this work Williamson promotes the need for governance structures; those that enable the 'costs of planning, adapting and monitoring transactions...to be considered.' (Williamson, 1985, p.46). For Willliamson, governance structures are not only present within firms, but also should help span them when transactions are established[2] (see Section 6.2). The additional stimulus to governance structures within Williamson's theory, arises from *Opportunism*; 'self-interest seeking with guile' (Williamson, 1985, p.47). Human nature is described as going beyond the proclivities of the 'simple self-interest seeking' individual to strategic or evasive conduct such as misrepresentation of facts, lying, cheating, skirting rules and calculated efforts to mislead. The combination of bounded rationality with opportunism leads Williamson's economic individuals, when compared to their neoclassical counterparts, to be '...on the one hand, less competent optimisers and, on the other, better liars, cheaters and shirkers.' (Masten, 1999, p.39). A Machiavellian interpretation of the economic individual is openly stated (Williamson, 1985, p.48).

3.2.4 The Resource-Based Approach

In contrast to Williamson's transaction cost framework, a resource-based approach offers an interesting alternative perspective for the interpretation of findings (Kay, 1992; 1993; 2000). Such an approach is epitomised by the works of Edith Penrose (Penrose, 1959;

[2] When asset specificity is high, for Williamson (2002) 'credible contracting' can only be achieved if the appropriate safeguarding governance structures are in place. These include: information disclosure, penalties, specialized dispute resolution mechanisms and verification mechanisms.

1971). Her focus on endogenous growth, and the role of knowledge generated within firms, provides a useful perspective. An application of her approach would follow the reasoning that a firm's existing experience and skill may determine the 'direction of [firm] expansion' (Pitelis and Sugden, 2000, p.3). Influenced by Penrose's work (Richardson, 2002, p.37), Richardson (1972, p.231) also reasoned that *resources*, namely knowledge, experience, and skills were what determined how functions ('activities') were managed by a firm. His writings reinforce the view of the Austrian School economist Hayek, that knowledge is uncertain and unevenly distributed, rather than 'perfect' (Hayek, 1937). It is through a focus upon a firm's resources that Richardson constructs his theory for interpreting when in-house versus out-sourced provision is chosen. He divides the activities required by a firm into two groups: *Similar activities* and *Complementary activities*. The former relate to those activities which require the same capabilities for their undertaking, whilst the latter, refer to activities which represent different phases of the process of production and require, in some way, to be co-ordinated. Following this schema, he determines that for any firm with a given set of resources, the incorporation of an activity can fall into one of three categories. Such activities may be: both similar and complementary, in that they may be co-ordinated by direction within an individual business; complementary but dissimilar, in that co-operation provides an alternative; and neither complementary nor similar, in that responsibility is held by differing firms and the market mechanism prevails (Foss, 1994). Offering the middle-ground alternative of 'co-operation' between firms, Richardson's formulation of co-ordination, represents an interesting alternative to Williamson's opportunistically based theory. More recent support for the idea that 'planned co-ordination...can be effected through co-operation between firms' (Richardson, 1972, p.240) may be drawn from the re-examination of the classic example of market failure, General Motor's acquisition of Fisher Body (Coase, 2000; Freeland, 2000; Casadesus-Masanell and Spulber, 2000). Contrary to the classic interpretation, that the merger proceeded because of concerns over transaction-specific investment and holdup, detailed historic research shows that a 'working relationship prior to the 1926 merger exhibited trust rather than opportunism.' (Casadesus-Masanell & Spulber, 2000, p.67). The merger reflected time-specific economic considerations, not an immutable market failure.

3.2.5 Contract Incentivisation

The divide between Williamson and Richardson's theories, over the issues of Opportunism and Co-operation, are most acute when applied to contract incentivisation policies. For Williamson (2002), Opportunism renders a contract subject to unrelieved hazard, unless safeguarding governance structures, such as incentivisation measures, are in place. His theory promotes the concept that incentivisation should be prevalent in any contract where a degree of asset specificity is present. Richardson, in contrast, takes a broader perspective. As Langlois (1998, p.193) describes, Richardson is 'interested in the *co-ordination of production*, not merely in the *co-ordination of commitments*.' For Richardson, asset specificity can be overcome through co-operative arrangements of production (Langlois, 1998, p.192); incentive safeguards to mitigate opportunism are not essential. In contrast to this, Williamson focuses on the co-ordination of commitments (the transaction) and argues that trust is 'irrelevant to commercial exchange' (Williamson, 1993, p.469).

The different approaches towards incentivisation adopted by Independents can be interpreted through the contrasting perspectives of the aforementioned theories. In Section 6.2, this method of interpreting results from two differing perspectives is shown both to be helpful in testing the validity of each theory, and in providing explanations for the results found. This method of analysis is most fruitful when reconciliation of two opposing theories is achieved. In Section 6.2.6, this is attempted with respect to the process by which Independents, as they grow in size, internalise new functions.

3.3 NEGOTIATION

3.3.1 Introduction

The need for negotiation permeates the petroleum industry. Interdependence and conflict, the characteristic stimulants to negotiation (Lewicki and Litterer, 1985; Bazerman and Lewicki, 1983), are acutely present in the corporate / State, stake-holder divide. Reconciliation is essential to the efficient functioning of the system; States guard access to the petroleum resource holding territory, whilst corporations possess the ability to co-ordinate the necessary labour and capital for resource extraction and value creation. For the E&P firm, success in negotiations with governmental licensing bodies is especially important, if access to resources is to be secured.

Negotiation involves a process of struggle, conflicting interests of opposing parties are reconciled in order for a mutually agreed solution to be derived (Johnson, 1993). From the corporate perspective there are three aspects to licensing negotiation: the *approach*, the fortuitous behavioural methods adopted that may channel a firm's efforts successfully; the *content* of the proposal, the technical action that is to be actually implemented; and the *context* the environment in which both the approach, with its accompanying content will be applied (Fig 3.3.1).

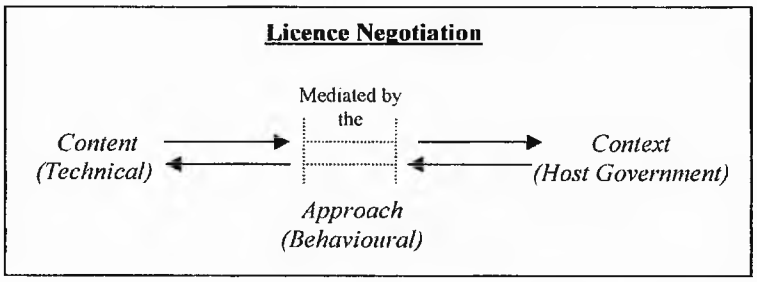


Fig 3.3.1

The *content* of a proposal, relates to the programme of work that a petroleum company proposes to undertake. It contains the substance of the negotiation, what the firm proposes to do on receipt of a licence. Drawing from the assessment criteria utilised by UK Government's licensing agency, the DTI, a series of significant proposal content factors may be recognised (DTI, 2003). The first pertains to geological assessment; part of the scorecard scheme implemented by the DTI for assessing licence applications

targets the thoroughness of the technical analysis made by the firm in its work proposal. Technical analysis is marked with respect to categories including: evaluation of stratigraphic levels, regional analysis and interpretation, identification of prospectivity, and use of relevant seismic database. A further factor is the level of commitment to drill, the DTI reports different marks to be given for differing types of drilling commitments in a work programme. A 'Firm well' equals a resolute commitment to drill a well. A 'Contingent well' is similar to a firm well, except it includes the explicit provision for commitment to waived if a specified geotechnical evaluation suggests drilling would not be justified – the evaluation being another element of the same Work Programme. 'Firm wells' are granted the highest score, 'contingent' the lowest. A further factor targeted by the DTI is financial capability - 'DTI [must] satisfy itself that it only issues licences to companies who can afford to complete the Work Programmes they are offering' (DTI, 2003, p.5). Finally, innovative application or development of technology is reported by the DTI to be favourably rewarded by their system. Beyond the content aspects flagged by the DTI, with a specific feature of this thesis being to examine decision-making speed and rapidity of action, the content factor of the rapidity of work programme should also be incorporated. Although, the above measures are mainly drawn from the context of the UK, they still act as a useful set of generic measures for determining what content factors are of greatest influence upon award of licence and how their relative significance may vary according to the context in which they are applied.

The approach adopted for negotiation is context bound: certain contexts require certain approaches. As a highly international industry, the context to petroleum licensing negotiations is strongly variegated. In accordance with the work of Salacuse (1991; 2003), the following research interprets his barriers of differing: laws and legislature, bureaucratic systems, and culture as important contextual factors to which the adopted negotiating approach must be sensitive. This research does not attempt to disentangle how the given context is derived, influential constituents (Fig 3.3.2) are acknowledged, but emphasis is placed upon the resulting context rather than the process causing its genesis. Research focuses upon the negotiating approach applied to the context. What

causal approach factors are most suited to a given context, and are any of the features particular to Independents part of that approach?

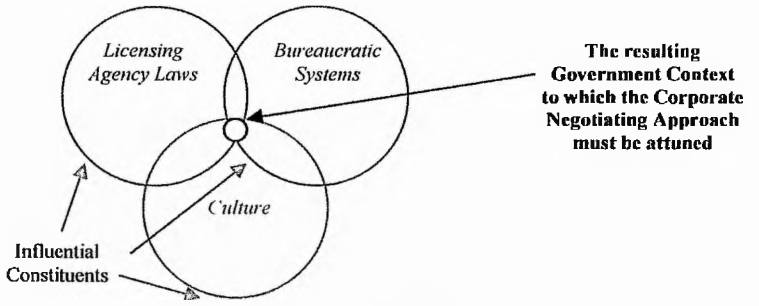


Fig 3.3.2

To-date, there is no research either within, the petroleum industry or the growing SME literature, that specifically identifies the strengths and weaknesses exhibited by SMEs in negotiation scenarios. Yet, strength in negotiations has been noted as a feature central to Independents' ability to 'cultivate their connections' with foreign governments (Economist, 1998). The two causal features of the Independent approach expressed are: firstly, the seniority of the Independents' company representatives used during negotiations, and secondly, the low turnover of negotiators among Independents, the same company representatives are present at each negotiating meeting. Though proposed as the negotiating strengths of Independents, these two variables should be compared with further causal variables (less associated with firm size) particularly those approaches drawn from the constituent elements of context: the bureaucratic system of government and culture. Comparison enables the postulated strengths of the Independent approach to be examined relative to the overall context driven approach required.

3.3.2 The Independent Approach

The seniority of company representatives is widely acknowledged as an important aspect to any negotiating approach. Seniority confers both an element of importance and the authority to commit. Importance may assist in facilitating access to senior personnel within the host government (Marsh, 2001), whilst decision-making authority can both hasten the negotiating process and facilitate the overall likelihood of success (Kapoor et al, 1991). For a negotiated solution (success) to be achieved, the principle personnel that

hold the authority to commit on both sides, will eventually need to give their consent to action. For Independents, seniority has been reported as a key success factor of their negotiating approach: 'politicians in developing countries sometimes prefer to deal with the boss of an Independent than a mere manager of an oil giant.' (Economist, 1998).

A second reported Independent strength, is the use of the same company representatives at each negotiating meeting. Repeated interaction is widely noted as an essential constituent to the incremental establishment of trust (Ring and van de Ven, 1992; Child, 1998). Drawing from alliance literature, high turnover among the personnel of management teams is recognised as one of the most significant barriers to the establishment of inter-organizational trust (Yoshino and Rangan, 1995). Kelly et al. (2000) have noted that high levels of management turnover, common in large firms, complicates linkage; there is a constant requirement to bring new managers 'up-to-speed'. This takes time, and as a result slows the overall negotiation process (Salacuse, 1991). In contrast, continuity of negotiating team members enables the establishment of shared knowledge that can help both sides to reach an agreement (Salacuse, 1991).

3.3.3 Licensing Agencies and the Bureaucratic System of Government

Authority to commit also extends to the realm of the State. Salacuse (2003) stresses the importance of accessing the appropriate department, and government official. Accessing the wrong official can result in false promises that will later unfold as the deal progresses. The need to incorporate all the appropriate government departments in a decision is also emphasised. Firms must know which State departments/agencies to contact and strive to include their representatives in any negotiations. The potential for bureaucratic conflict is 'almost always present' and firms should seek to prevent such an outcome through a process of inclusion (Salacuse, 2003).

Beyond accessing the appropriate official, a further important feature to securing a licence from a government bureaucracy, may be persistence. State bureaucratic agencies vary in both their efficiency and prioritisation. Constant contact or repeated attempts by the firm to secure a licence may stimulate recognition of the firm or speed an application

through the system. Although persistence is not a feature readily noted in the negotiation literature, initial inductive research suggested it to be significant to oil licence applications. Hodgshon and Land (2000) recount how government systems for acreage allocation vary widely. The most competitive format is that of the Bid Round. Where, during a fixed time-frame (round), companies prepare bids for specified acreage blocks, these bids are assessed by the government according to set criteria and a winner is selected. As the preferred method in countries such as the US, North Sea, Australia and Brazil, the system is positively noted as being consistent with principles of competition and fairness. A further system holding a competitive element is the Contested Application; companies are free to apply for open acreage at any time, but once an application is registered the government is required to invite competing applications during a fixed period. The final system, of non-competitive licensing arrangements where countries rely upon bilateral dealing, are equally common. With open access to acreage, operating under a 'first come, first served' principle, the system is open to manipulation. Firms not first in queue may attempt to influence award decisions, this is especially true in scenarios where award allocation is centralised with one particular oil minister (Hodgshon and Land, 2000). Although the growing tendency is towards competitive bid rounds, all governments, regardless of licensing system, retain a discretionary element: '...the invitation to bid provides no indication of how bids will be evaluated' (Hodgshon and Land, 2000, p.75). The above licensing systems only provide surface distinction, determining their actual operation can only be derived from those who have experienced the system. Consequently, categories for licensing allocation systems do not provide accurate measures of the licensing context with which firms must engage. A more generalised distinction of context is required.

3.3.4 Culture

A further key constituent of the particular context to which a negotiating approach must be attuned, is culture. When defining culture, two schools of thought dominate. From sociology, emphasis is placed upon behavioural traits of the organization (Salancik, 1977; Meek, 1988); culture is embedded in history and structural relationships, its systems, procedures, policies and processes. In contrast, the Perceptions School (Legge,

1994; Beer et al, 1990), originating in psychology, focuses upon the individual, culture is something an organisation 'has'. Following an interpretive emphasis, culture is the set of psychological predispositions that lead members to act in certain ways. A further hybrid approach to understanding the cultural context, that sits between the above nodes of traits and perceptions, is the work of Hofstede (1994). Focusing upon the resulting practices, that are stimulated by cultural values, Hofstede's hybrid positioning is replicated in much research into cross-cultural negotiation (Lin and Miller, 2003; Martin and Herbig, 1997; Herbig and Gulbro, 1997). Though it is beyond this study to delimit the heterogeneity of cultural particularities that influence the overall negotiating context, acknowledgement of the cultural element has been incorporated. Herbig and Gulbro's (1997) findings that the presence of bicultural brokers, host-country nationals, in a negotiating team is positively associated with successful negotiation, confirms Kapoor et al's (1991) identification of the advantage that a national representative may confer. Herbig and Gulbro (1997) do not however, question the significance of this cultural variable relative to other, non-cultural aspects of the negotiating approach. The current research, incorporating Salacuse's (2003) recognition of approach defining bureaucratic features, introduces non-cultural aspects of 'persistence' and 'accessing the appropriate official' to the negotiating approach.

Beyond features of the behavioural approach, in an equitable system, it is the content of a licence application that should rationally determine the outcome. Whilst it may be assumed that technical content will always be the primary determinant, rather than the behavioural approach utilised, governments will differ according to the relative weightings that are inadvertently placed upon each. The behavioural approach is likely to be more influential in some countries than others. Likewise, technical factors may be more closely scrutinised in some countries than others. Herbig and Gulbro (1997) found that firms using country or cultural experts were more likely to succeed than those concentrating upon business or technical experts as their sources for briefings. However, their research only considered one context, 'foreign negotiations', this constituted business negotiations undertaken with parties outside of the US.

Further contextual separation is relevant along a Western / Non-Western divide. Such terminology usefully probes an aspect of the bipolar divisions in the current global system (Watts, 2000). Similar to the macro-terminology of North-South, the Western / Non-Western divide receives endorsement from studies of government bureaucracy (Ye, 2003; Peters, 2001; Beetham, 1987). Within cultural studies a measure of distinction is also noted between the two contexts. Marsh (2001) draws distinction between Western style culture where the socialization process is orientated towards the individual, whereas in other cultures, association is more towards the group. Additional support may be sourced in Salacuse (1998), who found Non-Western countries such as Argentina, China, Mexico and India to place greater negotiating goal emphasis upon the establishment of a relationship than in Western - Spain, France and the US - where negotiating goals were focused more towards the contract itself. A similar differential is recognised by Kennel (2000) spanning between 'relationship' and 'legalistic' based countries. Although all countries are noted as a combination of both contract and relationship, the relative importance does vary between countries. For many 'the quality of relationship between decision-makers is at least as important as the language of the agreement' (Kennel, 2000, p.182).

With approximately half of the total licence interests held by our Independent population being sourced in Non-Western countries, the geographic distinction of the occident (Europe and North America) provides a simple divide for analysing how differing behavioural approaches and technical content operate in the two contexts: Western to Non-Western. This geographic distinction enables the proposed negotiating strengths of Independents to be tested for two separate macro contexts - Western and Non-Western governments. Whilst the constituent elements of each context may be heterogeneous (Fig3.3.2), in aggregation a degree of homogeneity is produced: distinction between the 'West' and 'Non-West' contexts becomes apparent.

3.4 INTERNATIONAL STRATEGY

3.4.1 Introduction

Research into the internationalisation strategies of resource companies is extremely 'scarce' (Lewis and Minchev, 2001). Existing research emphasis predominates towards companies engaged in secondary and tertiary activities (Coviello and McAuley, 1999; Papadopoulos and Denis, 1988; Berra et al, 1995; O'Farrell et al, 1998). Penetration of a firm's products and services into new foreign markets is the prevailing focus. In contrast, for firms involved in primary activities, such as raw material extraction and production, location of international activities are mainly weighted towards accessing the scarce resource, rather than accessing a particular market. Without the downstream activities of transportation, refining and marketing functions, international strategy of the upstream exploration and production company is oriented towards securing supply. Unlike the traditional choice for SME internationalisation strategies between exporting or Foreign Direct Investment (FDI[1]) (Majoochi and Zucchella,2003), for a foreign supply to be secured FDI is the only option available to the Independent.

Two pertinent channels of inquiry that may be drawn from the existing research upon FDI strategy are: firstly the causal stimulus, the rationale for seeking foreign operation, and secondly, the process followed in increasing international operations. An example of the former is the work of Landeau (1977), who uniquely sought to determine the rationale of why US Independents chose to expand abroad. Whilst the latter, queries how international expansion unfolds (Anderson,1993; Oviatt and McDougall,1997; O'Farrell et al,1998); which countries are chosen and why. Once more, within internationalisation process literature, emphasis is towards market penetration rather than access to supply. Nevertheless, the models developed do possess a degree of transferability, and application to the current topic is fruitful.

[1] Pitelis (2002, p.3) 'FDI is the control of production which takes place in one country by a firm based in another country'.

3.4.2 Why Internationalise?

Reviewing the sporadic postulations within oil industry literature concerning why US Independents expanded abroad and combining these with archived Independent annual reports, Landeau (1977) distilled a set of ten factors commonly attributed as key stimulants to internationalisation. Through a set of 14 interviews, Landeau tested the relevance of these factors for the initial move abroad of US Independents. Methodologically, Landeau's probing of ten industry-specific causal factors has contemporary support. For example, O'Farrell et al (1998) in an exploratory study, similarly employs a set of several 'qualitative factors' to assess internationalisation of business service SMEs. Utilisation of *several* qualitative factors may augment the possibility that the most pertinent variables will be identified (Kuo and Li, 2003). For Landeau, four of the most significant factors reported included: *Company's oil reserves expansion* (30% of US Independents), *Increased cost of finding oil domestically* (15% of US Independents), *Greater potential of oil areas abroad* (10% of US Independents), and the *Higher return abroad* (5% of US Independents). Each of these factors has thus been incorporated into the current research thesis. Following a similar methodology[2], this study enables the applicability of Landeau's principle factors to be tested for the British Independents.

Landeau's interviews found *Company's oil reserves expansion* as a 'general and permanent concern' among the companies. Such concern is evident within the British Independent population; annual reports typically place strong emphasis upon reserve growth. With reserves described as the 'essential economic strength' of an exploration and production company (Bauquis et al, 2000, p.152), focus upon this variable may be investor orientated. Indeed, Antill and Arnott (2000) stress the importance of reserves to valuation practices. Evaluation of a company's reserves is a key aspect that informs the calculation of net asset values by investment analysts. Estimated net asset values of Independents, relative to their market capitalisation, are one of the principle measures used in the valuation of exploration and production companies (Rose and Wilders,

[2] Landeau used direct interviews to obtain his data.

2003)[3]. Reserve growth is traditionally associated with share price rise[4]. Thus, firms seeking to boost their share prices, will be likely to be orientated towards expansion of oil/gas reserves[5].

The declining exploration success rate and diminishing presence of cheap, easily accessible oil within the US *Increased the cost of finding oil domestically.* Whether increased 'finding costs' (Antill and Arnott, 2000) are the stimulus to an international move, by British Independents, is also queried by this research. An additional factor identified by Landeau, and incorporated into this study, pertains to the *Potential of oil areas abroad.* Many foreign countries were perceived as under-explored and therefore highly prospective. For Landeau, focusing on US entries abroad during the 1950s, the *potential oil areas abroad* mainly related to Middle Eastern countries. Within our contemporary study, *potential areas* have moved beyond this heartland to include countries often referred to as the 'non-traditional petroleum countries'[6] (O'Connor, 2000, p.139). These are countries which, until the 1980/90s, had been closed to international oil companies and the private sector. Such countries are various, but include: Argentina, Yemen, Romania, Poland, China, the former Soviet Union, and Bangladesh. Release of *potential* among these countries', is generally posited upon the application of private sector ideas, methods and technology (O'Connor, 2000). Finally, drawing from Jacoby's (1974) reasoning, that the move of US firms overseas was due to the attraction of the higher profits being reported there, Landeau incorporated the *Higher return abroad* factor. Whether enhanced profitability of foreign ventures is an influential stimulus to foreign expansion is also tested for the British Independents.

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[3] 'Our main valuation methodology is analysis of Net Asset Value' (Rose and Wilders, 2003, p.5).

[4] Paladin's continual share price rise over the past 4 years, may be associated with its consistent expansion of petroleum reserves through acquisition (Annual Report, 2002, p.13). A further example of the direct influence of a company's reserves upon share price, is demonstrated by Shell. Following the revelation that it had overestimated its oil and gas reserves by 20%, the share price instantly fell 7% (Hoyos, 2004).

[5] Many fund management companies are restricted to selecting shares in companies above a certain market capitalization. As an E&P company increases its market capitalization, the pool of fund managers willing to invest in the oil firm will similarly increase. (Author's Internship with a fund management corporation, 2002).

[6] In contrast, the 'traditional petroleum countries' are those where the international petroleum industry had been concentrated prior to the 1980s. These are stated to include the: Gulf of Mexico, North Sea, and a small number of countries in the Middle East, West Africa, and Southeast Asia (O'Connor, 2000, p.139).

Following an exploratory methodology, in addition to the above four factors identified by Landeau, several further factors have been included in the current research. Some of the additional factors (*Less competition abroad*, *Lower monetary commitment*, *Greater possibility of control*, *Improved fiscal terms*), are refined versions of non-significant factors (*Decreased barriers to entry* and *Tax incentives*), probed in Landeau's research. Other factors are novel to this research (*Portfolio diversification, Proximity to market*, and *Utilisation of Existing Contacts*), and have been included to broaden the initial framework initiated by Landeau. Each factor will now be explained in relation to the reason for its incorporation.

The first set of factors relates to *access*, they refine Landeau's *Decreased barriers to entry*, into the following categories: *Less Competition Abroad*, *Lower monetary commitment*, and *Greater possibility of control*. An initial field interview with an investment analyst specialised in the petroleum sector, noted Independents to only gain *access* to "basket case" countries. Unable to compete for more preferable areas, Independents were noted to gain access mainly to countries where there was *less competition* for licences. A further access factor may pertain to the *monetary commitment required*. In a capital-intensive industry (Bauquis et al, 2000), there will be occasions when the lower collateral of smaller firms restricts the amount a given lender is willing to provide (Calomiris and Hubbard, 1990). (see Section 6.1.2.4) For large-scale projects, the total capital possessed by Independents could be insufficient. Experience of such scenarios, may stimulate Independents to seek countries where the average project requires a *Lower monetary commitment*. For certain countries (UK being given as an example), initial inductive enquiry suggested Independents often had difficulty achieving the position of licence Operator. Thus, when considering the rationale supporting an overseas move, the *Greater possibility of control* (i.e. being an Operator) is incorporated. Similar to the inclusion of taxation by Landeau, the possibility of *Improved fiscal terms* being offered by a foreign government is considered as a further potential rationale for overseas expansion.

Another factor, often referenced by petroleum industry literature (Foss, 2000; Bauquis, 2000; Barry, 1993) regards the strategy of *Portfolio diversification.* Grounded in the risk minimising principles of Markowitz (1970), exploration and production companies are recommended to hold projects with different risk profiles (Bauquis, 2000). Risk is often segmented according to various categories. Within the petroleum industry such categories usually include: technical risk, the complexity of a drilling and its likelihood of success; political risk, the possibility that governments may re-adjust the existing terms and conditions set; and security risk, the risk of insurgency (Foss, 2000). In line with the principles of portfolio diversification (Markowitz, 1970; Vickers, 1987; Brealey and Myers, 1996), companies may seek to acquire licences that differ in their risk profiles. For example, Licence A could be in a country where technical risks are typically low, but political risk is high: Licence B, in a country where technical risks are high, but political risk is low. As will be discussed (Section 6.4.1), simultaneous holding of Licences A and B within a portfolio, can reduce overall firm risk to a greater extent than if only one licence was held. *Portfolio diversification*, the attempt to hold projects with differing risk profiles so as to reduce overall firm risk, is an additional factor that may stimulate the internationalisation of Independents.

Reflecting upon the market vs. resource supply, locational pull discussed earlier, *Proximity to market* was incorporated to test its relative significance. Finally, with many Independent CEOs and Directors having worked overseas prior to establishing or joining an Independent, Granovetter's (1973) concept of the strength of weak ties, through the *Utilisation of existing contacts*, was a further internationalising factor to be incorporated.

3.4.3 Choice of Country

One of the most established models concerning the internationalisation of the individual firm is the Uppsala model (Johanson and Vahlne, 1977; Johanson and Wiedersheim-Paul, 1975). Still in receipt of contemporary support (Petersen and Pedersen, 1997), the model holds that firms will follow an incremental internationalisation process, whereby the

selection of foreign markets will proceed in order of 'psychic distance'[7]. Those markets most proximate - for example in terms of culture, political system or language - to those in which the firm already operates, will be entered first. Indeed, the Uppsala measure of psychic distance is similar to our understanding of 'context' described in Section 3.3. The Uppsala model is, however, market focused in orientation, emphasis being placed upon market distance (alias *context distance*). Whilst this is also applicable to the E&P firm, a further element of distance can also be conceived, that of geological distance. Differing geological basins will require differing specialist knowledge and experience. Some of this knowledge and experience may be transferable to other fields within the same basin, and occasionally to foreign basins. In accordance with the Uppsala framework – for which a firm's existing knowledge is recognised as the determinant of the expansionary path chosen (Andersen, 1993) - it may be hypothesised that Independents will choose to enter those foreign countries where the geological distance is least, in countries where their existing knowledge and experience is most applicable. This concept resonates with a resource-based view of the firm.

3.4.4 Mode of Entry

Beyond country choice, the second dimension to the internationalisation process is choice of entry mode (Andersen, 1997). Applied to Independents, entry mode may be interpreted as the choice between whether to be Operator or Non-Operator of a foreign licence. The move to Operate is associated with a greater degree of resource commitment, because the Operator is responsible for staffing and managing the joint venture[8]. According to Barry (1993, p.5) it is the 'Operator's duty and privilege to propose the work programme'. Use of the operator's co-ordinating resources for running the activities is not, however, refunded with a profit mark up. Partners will reimburse the salaries and sums paid by the Operator, but there is no extra payment for the use of its co-ordinating abilities[9]. Drawing upon the perspective of the Uppsala model (Johanson and

[7] By this they mean the differences between any two countries in terms of business practice, culture, language and legislation.
[8] Within the upstream petroleum industry, the joint venture is the dominant structure adopted by firms when entering into E&P licences.
[9] This extra effort is not exempt of beneficial return, Operating confers a degree of authority over both the size and timing of work programmes (Barry, 1993).

Wiedersheim-Paul, 1975), where it is predicted the mode of entry will follow successive stages of increased commitment, moving from initial export to later FDI, this thesis questions whether a similar strategy of reduced commitment (Non-Operator), followed by that of higher commitment (Operator) is characteristic of the moves abroad undertaken by Independents.

3.4.5 Born International?

The model of incremental internationalisation has received criticism. Oviatt and McDougall (1997) detail the UNCTAD (1993) and OECD (1997) reports which found that even though most firms still appear to internationalise in an incremental way, a small number of firms are international at founding. Although the 'born global' research (Bell et al, 2004), similar to other works in the internationalisation literature, is focused upon secondary and tertiary activities, aspects of its enquiry may be applicable to the upstream petroleum industry. However, in probing this aspect, definitional distinction must be observed. If a firm is to be 'born international', then this implies that from its naissance it started with interests in several countries, almost simultaneously. This should be contrasted with what can be classified as 'born foreign', where a company at naissance holds its headquarters in the UK, but its first active interests are in one foreign country. The applicability of this differing terminology will be tested for our Independent population.

3.4.6 Business Model

Although the above sections question whether the underlying rationale for internationalising may be grounded in a universal theory, such as the resource-based approach, a more specific, intra-firm driver may be the source of the action. Individual firm actions must be observed in relation to the aggregate of all the actions undertaken by a firm. Awareness of the full system may enable the placement of the single action to be rationalised. Certain individual choices may be explained by observing how they fit within the overall logic of the firm's business model. Determining a firm's business model as an external observer is difficult, although when sufficient numbers of key

variables are pieced together, then patterns will be likely to emerge (Miles and Huberman, 1994).

PART 2 EXPLORING THE FIELD AND FINDINGS

4. FIELDWORK METHODOLOGY

4.1 Orientation

Set within the 'secretive' exploration and production industry (Beard and Burk, 2000), and having received minimal social science research, British Independents are largely an unexplored set of firms (Section 1.1). Fieldwork was thus a necessity if these companies' organizational strengths and competitive strategies were to be investigated. As discussed in Sections 1.2-1.5, each of the four principal channels of inquiry was inductively determined; elements of grounded theory (Glaser and Strauss, 1967; Strauss and Corbin, 1998) were followed during the initial stages of research. Channel selection was informed and verified through a variety of sources, including interviews with key individuals, conference proceedings, documentary and archival data[1].

4.2 Instrumentation

Having delimited the four channels of research focus, the primary method chosen to obtain data pertinent for the study was through face-to-face interviews. This study utilised both qualitative and quantitative tools, since this is often recognised as a useful method for attaining richer detail from fieldwork (Miles and Huberman, 1994, p.40). Each type of data can be used to supplement and corroborate the other. Therefore, a semi-structured interview agenda (SSI) was designed (Appendix 1.1), as this enabled both qualitative and quantitative data to be derived. As exemplified in the writings of Reid (1993 and 1998), this instrumentation format is suited to small sample research, for it enables the particularities of individual firms to be acknowledged, whilst simultaneously permitting generalised conclusions about the average firm to be drawn. The SSI crafted for this study incorporated a range of differing question devices to extract the relevant data. These devices include: *Grid Framework* (Questions 1.1, 1.4); *Ranked Alternatives* (Questions 1.6, 1.7, 3.1, 3.2); *Scenario Response* (Question 1.10);

[1]For example, interviews with Professor Kemp (University of Aberdeen); Iain Patrick (ex-Commercial Director of Independent Monument Oil); Petroleum Research Analyst (Analyst A); Timothy Milne (Director HS Pipe Equipment); attendance at The Offshore Europe Conference, Aberdeen and The Royal Bank of Scotland North Sea Conference, London; company annual reports; Energy Institute newspaper archives, London.

Spectrum Design (Question 3.4); and *Probe Structured* (Questions 1.5, 3.5, 4.1)[2]. Following Bryman's reasoning (1989, p.49), both open and closed-ended questions were incorporated in the SSI. This mixture proved fortuitous because interviewee disposition also varied between the loquacious and occasional pauciloquent type. Although the same set of SSI questions was administered to each Independent, similar to Eisenhardt (1989), an inductive element also existed; questions were often supplemented with ones that seemed fruitful to investigate during the interview. Prior to implementation the SSI was reviewed by Professor Kemp of the University of Aberdeen and piloted with Iain Patrick, the ex-Commercial Director of the old Independent, Monument Oil.

Initial communication with Independent firms was in the format of a pre-letter (Appendix 1.3). This detailed the nature of the study and aimed to stimulate recipient interest in the interview requested. To accompany the letter an Agenda Outline (Appendix 1.4) and Basic Data Sheet (Appendix 1.5) were scripted. The former documented the topics to be covered during the interview, whilst the latter requested quantitative information. Letters were sent to either the Technical Director or Chief Executive Officer of each Independent, and a follow-up call was made one-week later. Choice of interviewee (Technical Director/CEO) was made following an analysis of company annual reports; the manager recorded as holding the longest period of tenure in the firm was contacted. Out of a population of 21 Independents, 14 consented to interview. This arguably represents a very high (67%) response rate. Section 5.1 shows that this sample is representative of the population. Each interview lasted an average of 1 ½ - 2 hrs. Similar to Reid (1993 and 1998), note taking was favoured rather than dictaphone use. The primary rationale for this decision was that in an industry known for its secrecy, a dictaphone could result in interviewees being more guarded in their response. Instead, to maintain comprehensiveness of the notes made, immediately after each interview, an hour was spent reviewing them and any additional points that had not been adequately noted were detailed.

[2] The importance of open-ended, probe structured questions is discussed in Nachmias and Nachmias (1981, p.195) and a demonstration of the effectiveness of this device is presented in Reid's (1993 and 1998) texts.

4.3 Triangulation

As discussed in Section 1.1, further information sources were utilised to validate (triangulate) the findings of the interviews with British Independents. Firstly, a postal questionnaire was sent to the 55 North American (US and Canadian) Independents listed on the New York Stock Exchange and secondly, a series of 7 face-to-face interviews was undertaken with Aberdeen based International Drilling Contractors. For the North American Independents a series of questions from the original British Independents SSI was extracted and inserted into a two-page postal questionnaire (Appendix 1.9). This was sent together with a cover-letter (Appendix 1.10) to the Technical Director or CEO of each company. Twelve questionnaires were returned, representing a 22% response rate. Section 5.2 shows this sample to be representative of the total population as regards the cardinal statistic of market capitalization.

To provide an in-depth, and relatively impartial, perspective upon the operations of Independents, a sample of International Drilling contractors was also interviewed. For geographical purposes[3] this was limited to those Drillers listed in the International Association of Drilling Contractors (IADC, 2003) Directory noted as holding business premises in Aberdeen. Of the 13 Drillers contacted, 7 agreed to be interviewed. Similar to the procedure for the Independents a Pre-letter, Agenda Outline and face-to-face SSI were scripted (Appendix 1.6-1.8). Interviews on average lasted 1 ½ hrs and written notes were taken. Although the questions in the Driller SSI (Appendix 1.6) were different to those in Independent SSI (Appendix 1.2), similar question devices were employed.

4.4 Confidentiality

Although it was originally intended that confidentiality would only be applied to certain questions, the request for anonymity throughout by some firms, has resulted in the identity of all firms having to be concealed. Consequently, throughout this thesis Independents are coded alphabetically. These codes are in order of market capitalization. For example Independent A has the smallest market capitalization, whilst Independent N

[3] In the UK, the majority of International Drilling Contractors premises were located in Aberdeen.

has the largest[4]. This coding procedure is repeated for both North American Independents (NA to NL) and Drilling Contractors (A to G).

4.5 Data Analysis

All quantitative and qualitative data gathered through interviews and the postal questionnaire was entered into an SPSS database. The final data file for the British Independents comprised 284 separate variables. SPSS was considered an appropriate tool for both statistical analysis and data comparison.

[4] In Section 5.3.1 a one-off reference in Table 5.3.1 is made to an Independent O, this a North American Independent operating in the North Sea. Following our meeting at the LOGIC North Sea New Entrants Conference, Aberdeen, the Regional Vice President of Independent O accepted to be interviewed.

5. RESULTS

5.1 GENERAL CHARACTERISTICS OF THE POPULATION OF INDEPENDENTS

A wide range of data on firm size variables has been collected, because this enhances the possibility of exploring size-related effects[1]. The six measures of firm size used in this thesis are Market Capitalization, Net Assets, Annual Total Production, Turnover, Operating Profit, and Total Headcount. Table 5.1.1 shows the mean characteristics of the Independent population, when measured by these variables.

Measuring the Independent Population: mean, standard deviation and range of each variable				
Variable	*Mean*	*Standard Deviation*	*Min*	*Max*
Market Capitalization (£m)	137.52	146.01	10.41	583.75
Net Assets (£m)	83.17	94.39	2.36	326.78
Annual Total Production 2002 (boepd)	8527.53	13517.20	0	53600
Turnover (£m)	42.04	68.15	0	263.10
Operating Profit (£m)[2]	12.99	27.76	-8.58	104.10
Total Head Count	138.67	190.28	2	602
Age of Firm (yrs)	12.43	8.21	2	33

Table 5.1.1

The relatively high standard deviation (e.g. as a ratio to the mean) values displayed in Table 5.1.1 for the variables Market Capitalization, Net Assets, Turnover, and Head Count, suggests that the Independent population is relatively heterogeneous in terms of the constituent firms' sizes. This heterogeneity in size presents the opportunity of size comparisons being made within the Independent population. Hypothesis 3 (b), 3 (d) and 3 (e) (see Section 3.1) are all concerned with the impact that firm size has upon decision-making speed and rapidity of action. With Independents shown to be of differing sizes, the Independent population can therefore act as a suitable group for the testing of these hypotheses.

[1] This contrasts with the work of Wally and Baum (1994) who only investigated Turnover and Head Count as measures of firm size.

[2] Following the findings that Davies et al (1999, p.1507) relates, as to the subjective fluidity with which a firm can detail certain outcomes as *exceptional*, I have therefore not permitted *exceptional items* to be excluded from the calculation of Operating Profit. This comprehensive definition of Operating Profit, prevents firm manipulation from skewing the validity of this accounting ratio.

Whilst Independents are of differing sizes, the magnitude of the difference in Market Capitalization between the smallest (Pan Andean Resources) and the largest Independent (Cairn Energy) is less than that between the largest Independent and a typical Major (BP). Comparing Market Capitalizations, Cairn Energy is only 50 times larger than Pan Andean Resources, whereas the Major, British Petroleum is 150 times larger than Cairn Energy[3]. From this perspective, even the largest Independent is closer in size to the smallest Independent, than it is to a Major corporation such as BP. When compared to Majors, British Independents are relatively similar in their size, and in this sense can be treated as a coherent population[4].

Table 5.1.2 summarises the geographical scope of the operations undertaken by the Independent population. The table shows the average Independent to produce a greater percentage (71%) of its annual total production out-with the UKCS. Additionally, each company on average holds licence interests in more than three different countries. Overall, whilst Table 5.1.2 produces a useful generalised account of the 'average' Independent's international orientation, Section 5.6 reveals the more nuanced variety of ways in which this international orientation has been undertaken.

Geographical Scope of the Population						
Variable	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Annual Total Production within UKCS (MMboe)	1.03	0	-	2.11	0	6.79
Annual Total Production outside UKCS (MMboe)	2.08	0.56	-	3.53	0	12.81
% of Total Production outside UKCS	71.39	100	100	41.4	0	100
No. of Countries in which Interests Held	3.76	3	1	2.64	1	10
No. of Countries where Operator	2.11	2	1	1.52	0	6
No. of Countries where Non-Operator	2.37	2	1	1.89	0	7

Table 5.1.2

[3] The respective Market Capitalizations of the companies are as follows: Pan Andean Resources (£10m), Cairn Energy (£580m), and British Petroleum (£90,400m).
[4] Beyond firm size measures, a further aspect that distinguishes Independents from Majors, is the Independents lack of vertical integration (Section 1.1).

Table 5.1.3 displays the average level of Operatorship undertaken by the Independent Population. The propensity of holding the role of Operator (mean = 7.88) is shown to be less than the propensity of undertaking licences as Non-Operator (mean = 14.47). Independents on average hold more Non-Operated licence blocks than Operated (Table 5.1.3). A paired samples t-test of mean differences provides some support for this result (t-statistic = -1.893; Prob. value = 0.07). As discussed in Section 3.4, the role of Operator typically requires greater use of a firm's co-ordinating resources, than does the role of Non-Operator. From this perspective, the results suggest the Independents' tendency towards undertaking a Non-Operating role may be because this requires a lower degree of resource commitment.

Level of Operatorship among the Population						
Variable	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
No. of Operated Licence Blocks	7.88	6	4	7.44	0	30
No. of Non-Operated Licence Blocks	14.47	7	Multiple modes exist	16.16	0	55
% Operated of Total Licences	48.39	44.44	-	32.62	0	100
% Non-Operated of Total Licences	51.61	55.56	-	32.62	0	100

Table 5.1.3

Turning to the financial aspects of the Independents, Table 5.1.14 measures both their debt and profitability. Although the level of gearing within the population is low (mean = 11.47), there is a high level of variation between firms (σ = 16.21) (Table 5.1.4). Moreover with mean interest paid being 17.31% of the mean operating profit, suggests debt repayment for certain firms is high. A bivariate correlation between Market Capitalization and Gearing gives a 0.695 Spearman's rho correlation coefficient (Prob. value = 0.000). Thus, the larger the Independent, the higher the level of gearing. As is further examined in Section 6.1, the above correlation may be interpreted as a product of credit rationing amongst lenders (Calomiris and Hubbard, 1990). Lenders are less willing to lend when project size is large relative to a borrower's net worth (Calomiris and Hubbard, 1990, p.92). In the context of petroleum exploration and production, the greater collateral possessed by larger Independents means that lenders are more willing to lend to these firms vis-à-vis smaller Independents.

The cash generative nature of most Independents is shown by Operating Profit being approximately 30% of Turnover. This is a much higher ratio than for some Majors. For example, the equivalent ratios for Shell and BP are only 8% and 7% respectively[5]. However, the high coefficient of variation for this ratio[6], shows not all Independents to be cash generative, several displaying an Operating Loss. This result suggests that the level of profitability is highly variable amongst the Independent population. Annual Total Production is positively correlated with the average price received per barrel of oil equivalent (Pearson correlation coefficient 0.644, Prob. value = 0.044). This suggests that the greater a firm's production, the higher the average price received per barrel. Section 6.1.2.3 explains this finding using the argument that differential bargaining power is associated with different sizes of producer (Porter, 1998).

Measures of Debt & Profitability				
Variable	*Mean*	*Standard Deviation*	*Min*	*Max*
Gearing ((longterm liabilities / net assets + longterm liabilities)*100)	11.47	16.21	0	44.69
Interest paid (£m)	2.25	4.80	0	20.6
Interest paid / Turnover * 100	8.53	2.78	0	73.72
Operating Profit / Turnover * 100	29.43	324.39	-716	1216
Average price received per boe ($)	21.56	2.40	17.17	24.30

Table 5.1.4

Of the 21 firms contacted, 14 agreed to be interviewed. This constitutes a 67% response rate. Of the 7 firms that were unavailable or unwilling to be interviewed, 4 had their headquarters located outside of the UK and Ireland. An independent samples t-test was run to determine how representative the sample of 14 firms was relative to the total population. Results of the t-test of mean differences in Market Capitalization indicated no support for rejecting the assumption that the 14 respondents were representative of the population (t-statistic = 0.257; Prob. value = 0.799)[7].

[5] Calculations based on figures taken from the companies' 2002 Annual Reports.
[6] The coefficient of variation is the Standard Deviation / Mean, in this case (324.39/29.43 = 11.02).
[7] It should be noted that Market Capitalization acts as only one measure of a firm. There are more dimensions to a firm that extend beyond size (Market Capitalization). For example, Section 5.6 displays how the Independent population may be categorised according to the differing international strategies they display. Nevertheless, having achieved a high response rate (67% of the population), the results derived should still be considered relatively comprehensive.

5.2 CHARACTERISTICS OF THE NORTH AMERICAN POPULATION

Table 5.2.1 displays the average firm size of the North American population (£1919m) to be substantially larger than the British Independent population (£138m). An independent samples t-test of the mean differences in Market Capitalization between North American (£1919m) and British (£138m) populations, confirms this result (t-statistic = -5.281; Prob. value = 0.000). Sections 6.1 and 6.2, show this size differential to be a possible cause of some of the results produced when comparison is drawn between British and North American Independents.

Market Capitalization (£m) of British vs. North American Population					
Population	*N*	*Mean*	*Standard Deviation*	*Min*	*Max*
British	21	137.52	146.01	10.41	583.75
North American	55	1919.47	2491.20	10.35	10602.00

Table 5.2.1

Of the 55 North American Independents contacted, 12 questionnaires were returned, constituting a 22% response rate. An independent samples t-test was run to determine how representative this sample was relative to the total population. A t-test of mean differences in Market Capitalization cannot reject the hypothesis that the 12 respondents come from the parent population (t-statistic = 0.434; Prob. value = 0.666). Further support for this finding is presented in Table 5.2.2. Comparing the level of international activity within the sample (50%), relative to the population (44%), this table shows the sample to be generally representative of the North American Independent population[8].

Level of International Activity - North American Independents			
Variable	*N*	*% of Firms with activities in North America Only*	*% of Firms with International activity*
Population	55	56.4	43.6
Sample	12	50	50

Table 5.2.2

[8] Within forthcoming pages it should be assumed that any open reference to 'Independents' within text or tables refers to British Independents only. Should a comparison be made with North American Independents, that distinction will be clearly stated.

5.3 STRATEGIC DECISION-MAKING SPEED AND RAPIDITY OF ACTION

5.3.1 Decision-making Speed

The first piece of qualitative evidence to verify that the speed of decision-making is faster in Independents, relative to Majors, is presented in Table 5.3.1. The results displayed pertain to answers given by the seven Independent interviewees, who in their last job had been employees of a Major. When asked to compare their experiences of decision-making speed in the previous Major, relative to the current Independent, the response given by each interviewee was that "All" decisions were made more quickly in the Independent. Further probing of interviewees, revealed four particular operations where this differential in decision-making speed, between Major and Independent, was greatest. These specific operations included budgetary amendments (1/7), modelling processes (1/7), implementation of service operations (1/7) and, in particular, business development (4/7). Business development pertains to the activity of securing new exploration and production licences. It involves the action of "bidding for new interests" (Independent K) and the "time taken to negotiate [new] projects" (Independent G). As noted in Section 6.4.4, Independents' fast business development decisions are likely to be a source of competitive advantage (Chen and Hambrick, 1995; Pech and Durden, 2003).

In discussion of their experiences, interviewees also gave their interpretation as to why such a temporal differential existed for the speed of decision-making (Table 5.3.1). The prevailing reason pertained to formalization (Wally and Baum, 1994). The operations in Majors are described to be "much more systematised" (Independent N). Accountability of staff at lower echelons in Majors is reported to be below that of the equivalent personnel in Independents. Further, in Majors, systems were designed to "protect the corporation against poor decisions" (Independent O). Additional interviewees mentioned that the larger team size of Majors led to a slowing down of the modelling process. In contrast, more rapid decision-making among Independents is explained as a consequence of several factors: fewer layers of management; the ease of access to key decision-makers; and the spatial proximity of the team, illustrated by the phrase "everyone on the

Question 1.5
Have you been an employee of a Major or SuperMajor in the past?

Comparing your experience in Major A to current Indepenent A, for which particular operations do you notice there to be a differential in the decision-making speed?

Independent	**Comparator**	**Particular Operations (Descriptive)**				**Explanatory**				
		All Operations	*Business Development*	*Modelling Process*	*Implementation of Service Operations*	*Formalization*	*Team Size*	*Financial Terms*	*Communication*	*Focus*
D	BG	'Everything'	Can rapidly 'formulate offer… without involving consultants'	Within Independent = only '1 week to build model & 2-3 days to test'		'Follow a process in order to gain consistency…financial analyst, sales analyst, reservoir analyst, geology & geophysics analysts…need all to look at it'	Larger team, slows the modelling process		Spatial proximity: 'everyone on the same floor'	
E	Conoco	'All'	'especially on new ventures… [Independents spend] less time on evaluation'		Well intervention: stimulation; scale clean; acid wash. For example, formulation of the decision to undertake an acid wash would take 4hrs for Independent vs. 2 weeks for the Majors	Excessive Caution: Acid Wash Decision (Majors) = 'take well off production + risk assessment + health & safety review'				'Look at each [investment] opportunity on its own basis…therefore move quickly'
G	BHP	'very slow…whole process of management & decision'	'Time taken to negotiate projects'					'Excessive expectations of financial return' slowed business development negotiations		
J	Shell	'All'								

Table 5.3.1

Question 1.5
Have you been an employee of a Major or SuperMajor in the past?

Comparing your experience in Major A to current Indepenent A, for which particular operations do you notice there to be a differential in the decision-making speed?

Independent	**Comparator**	**Particular Operations (Descriptive)**					**Explanatory**			
		All Operations	*Business Development*	*Budgetary Amendment*	*Modelling Process*	*Implementation of Service Operations*	*Formalization*	*Concentration of Authority*	*Focus*	*Efficiency*
K	BP	'All areas'	'bidding for new interests'	Would take 1 month for Major A, whereas only 2-3days for Independent B. 'Capital allocation process is much simpler'			'flatter organization'	'Fewer layers of management'	'fewer assets' hastens capital allocation process	'Financial Discipline'
N	BP	'All of them…whole concept is different'					'everything much more systemised' 'systems secondary to personalities & people'			
O	Conoco	'All of them'					'Lot of bureaucracy built in, intended to protect the corporation against poor decisions'. Reduced accountability of staff at lower levels.			Ex: IT system transfer. Major estimated it would take 30 people over 4 months, Independent executed transition with 6 people in 30 days.

Table 5.3.1

same floor" (Independent D). In conjunction with other findings, these results are discussed in Section 6.1.1.

Results from interviews with the international drilling contractors provided additional evidence that decision-making speed is faster among Independents relative to Majors. All seven of the drilling contractor interviewees, specified Independents to be faster in their decision-making speed. Indeed, one of the most important strengths of a drilling contractor, undertaking work for an Independent, was reported to be the Independent's decisiveness (see Fig 5.3.1 and Table 5.3.2). Matching this result, the primary weakness for a drilling contractor undertaking a contract with a Major, was its insufficient decisiveness (sees Fig 5.3.2 and Table 5.3.3).

Fig 5.3.1 and Table 5.3.2 display the ranked strengths for a drilling contractor undertaking a contract with an Independent.

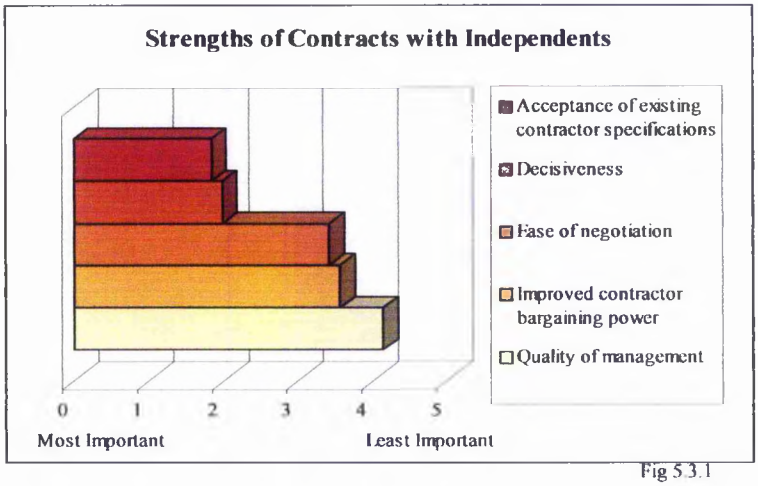


Fig 5.3.1

A Friedman test, $\chi^2 = 11.54$ (Prob. value = 0.021), shows it is unlikely the rankings for Fig 5.3.1 and Table 5.3.2 were derived by chance, and that the preferences expressed are therefore significant. The results also display a significant degree of concordance in the rankings chosen by respondents, as indicated by Kendall's W = 0.412 (Prob. value = 0.021).

Strengths of Undertaking a Contract with an Independent							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Acceptance of existing contractor specifications	7	1.86	2	Multiple modes exist	1.07	1	4
Decisiveness	7	2	2	2	.82	1	3
Ease of negotiation	7	3.43	3	3	.98	2	5
Improved contractor bargaining power	7	3.57	4	4	1.27	1	5
Quality of management	7	4.14	5	5	1.57	1	5

Table 5.3.2

Fig 5.3.2 and Table 5.3.3 display the rankings of weaknesses for a drilling contractor undertaking a contract with a Major.

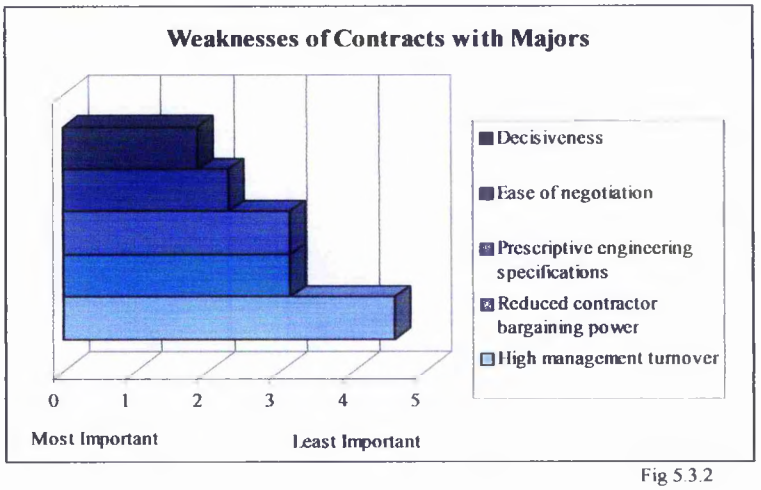


Fig 5.3.2

A Friedman test gives a $\chi^2 = 12.114$, (Prob. value = 0.017), which shows it is unlikely the rankings for Fig 5.3.2 and Table 5.3.3 were derived by chance and that the variables are therefore of differing preference. Results also display a significant level of concordance in the rankings chosen by respondents, as indicated by Kendall's W = 0.433 (Prob. value = 0.017).

Weaknesses of Undertaking a Contract with a Major							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Decisiveness (slow decision-making speed)	7	1.86	1	1	1.21	1	4
Ease of negotiation	7	2.29	3	3	.95	1	3
Prescriptive engineering specifications	7	3.14	3	2	1.21	2	5
Reduced contractor bargaining power	7	3.14	4	4	1.46	1	5
High management turnover	7	4.57	5	5	.79	3	5

Table 5.3.3

As with Independent interviewees, drilling contractors were asked to identify those operations where they had detected that the decision-making speed between Independent and Major was the greatest. Table 5.3.4 categorises the responses given. As Table 5.3.4 shows, the operation where the differential in speed of decision is most frequently noted (6/7), is that of the tendering process[9]. It was much quicker for a drilling contractor to engage in a tendering process run by an Independent, than one run by a Major. Contractor C reported Shell bids took "months" to generate. This time-consuming aspect was also noted by Contractor F. The paperwork and processes adopted in tenders with Majors were costly in terms of the amount of contractor labour time that a bidding procedure required (Contractor F). In contrast, Independents were more decisive in their approach; tenders could be formulated in "weeks" or even "days" (Contractor C). A further example of an operation in which Independents' decision-making was frequently (3/7) reported to be more rapid than that of Majors, was in the finalising of terms and conditions.

The explanations given by drilling contractor interviewees as to why decisions were executed faster by Independents, rather than by Majors, are illustrated in Table 5.3.5. One of the most frequently (4/7) specified causes relates to the *Spectrum of Consultation*. Majors' decision making processes were likened to decision by "committee" (Contractor A and C). The larger number of personnel consulted by Majors was given as a primary cause of the decision-making speed differential between an Independent and a Major. A further cause of slower decision-making among Majors, was the pursuit of individual goals ('sub-goals' in a Williamsonian (1975, p.130) sense) by certain persons incorporated within their decision-making process (3/7). For example, specialists in certain areas – safety or insurance being detailed – could be overly attentive of their particular area of responsibility. This "territorial" approach (Contractor B) was recognised as a consequence of "job protection" (Contractor A). For the contractor, this approach resulted in excessively onerous terms and conditions. Peters (2001, p. 167),

[9] Tendering is when an Operator (Independent or Major) invites drilling contractors to outline their proposals for a particular job to be undertaken on behalf of the Operator. The Operator reviews each contractor's proposal and chooses the one deemed most suitable.

Operations where a differential in decision-making speed between Majors and Independents is detected							
Contractor	*Tendering*	*Resolution of Technical Difficulties*	*Finalising terms & conditions*	*Rig specification*	*Documentation*	*Drilling Approvals*	*Safety*
A			'smaller the faster'	Will give an immediate answer as to what is required.			
B	'Usually easier to negotiate contract, tendering process is easier'		Yes				
C	With the bid tender, Shell & BP are more demanding in the clarification of items. For example, the Shell bid involved 15 manuals and 7 CD's, took months for us to generate the bid. Whereas for Venture, there was a list of small bullet points, and we were able to get back to them in a week.	'do get a faster response'					
D	'longer with Majors' . With smaller companies the contract tendering process is faster, 'driven by commercial requirement						
E	Yes				'Faster preparing documentation'	Faster in drilling approvals	'More flexible view on safety, not looking at safety but rely more on you as contractor'
F	The bidding procedure required by larger operators is more costly for our firm to undertake. A more complicated evaluation procedure is required, we must spend a lot of time pricing-in the bidding process. Whereas with smaller firms, intricate individual pricing is not required until after you have secured the work.		Independents such as Apache with Forties are 'extremely fast'.			'Decisions on a well'	
G	'Award of contract - small chain, few people involved'						

Table 5.3.4

Cause of Temporal Differential between Majors & Independents									
Contractor	*Number of People Consulted*	*Territorial Goals*	*Paperwork Involved*	*Partner Issues*	*Vertical Specialization*	*Operator Specifications*	*Bureaucracy*	*Short chain of command*	*CRINE Standard Contract*
A	BP & Shell, decision by committee	With Big Operators there are a lot of specialists, 'lot of job protection going on to point out mistakes.' Overemphasis upon less important specifications			Unwillingness to make a decision on your own in a large company	For everything offshore, it is more time consuming with larger operators, Shell especially. With Talisman there was none, apart from document numbering.	Bureaucracy	Short chain of command	Independents tend to use the industry standardised CRINE contract, because they have nothing else
B	'Everyone's brother needs to look at it'	In Majors can find individuals that are territorial on safety or insurance	'Shell is renowned for its long-winded procedure'	'Independents manage partner issues better, sort it out before hand, then go to tender. Majors do it after tender.'			Less in-house bureaucracy		
C	'Smaller team' 'Majors drill by committee'		More labour intensive in the forms filling & meetings required by larger firms.				Bureaucracy		
D			The 'larger the company the more luxury to undertake drilling well on paper exercises'					Short chain	

Table 5.3.5

Cause of Temporal Differential between Majors & Independents									
Contractor	*Number of People Consulted*	*Territorial Goals*	*Paperwork Involved*	*Partner Issues*	*Vertical Specialization*	*Operator Specifications*	*Bureaucracy*	*Short chain of command*	*CRINE Standard Contract*
E									Shell use it, only one of the Majors, lot of Independents use it'
F							'Majors struggling with bureaucracy, especially Shell'		
G	Large number of persons consulted	'Major terms and conditions and legal conditions are much more onerous'	With a Major there is 'more paperwork', 'just systems, not the size of the work' 'Independents don't have the systems.'	Tendering approach is more relationship based 'definitely so'	'Leave ownership to people on rig. With good drilling supervisors can save money, and save on process' 'Accountability with larger Operators is sometimes lost' 'The drilling supervisor of an Independent has nowhere to hide, whereas there is more politics in the larger firms.'		Less bureaucratic	Short chain of command	

Table 5.3.5

notes such actions are often characteristic of large bureaucratic organizations. Bureaucratic red tape and inefficiency in such organizations often results from the perceived need of lower echelons to protect themselves from superiors. They do this by complying with the 'letter of regulations', and by refusing to take any personal initiative beyond those regulations, because that might subject them to later punishment (Peters, 2001, p.167). However, in doing so, their actions reduce the effectiveness of the organization. Goal displacement is the result: rules become an end in themselves, rather than a means to achieve the aims of the company (Peters, 2001, p.167). Thus, a further cause of the slower decision-making speed reported for Majors appears to reside in the job protecting actions performed by some of their personnel. Similarly, business undertaken with Majors was reported to be paperwork intensive. This was not because projects with Majors were any larger than those with Independents. When Majors' projects were of a similar size to those undertaken with Independents, they still generated more paperwork (Contractor G). Paperwork was considered to be a key aspect of the slower decision process exhibited by Majors relative to Independents. As Contractor B stated "Shell is renowned for its long-winded procedure". Clearly the more formalized approach demonstrated by Majors, is an additional factor causing decisions to be made more slowly. This corroborates Wally and Baum's (1994) finding that a formalized process slows the speed of decision-making. A further element reported to slow decision-making was that employees of Majors were often unwilling to make decisions on their own (Contractor A). Mintzberg (1981) would explain such a finding through the concept of vertical specialization; namely, the extent to which a worker lacks control of the tasks he/she performs. Characteristic of extremely large corporations (Mintzberg, 1981), vertical specialization would explain why employees of Majors may not be encouraged to act autonomously and to make decisions outside of their limited authority.

Returning to the tendering process, Table 5.3.6 and Fig 5.3.3 show how the formalization of the tendering process varies between Independent and Major. Although both Majors' and Independents' tendering selection procedures display a bias towards the formally based side of the spectrum, closer examination of the responses shows the selection procedure undertaken by Majors to be more formally orientated than for Independents

(see Table 5.3.6). An independent samples t-test of the mean differences in formalization of the tendering process, between Independents and Majors, confirms this result (t statistic = 3.057; Prob. value = 0.022). Replicating the Likert scaling adopted for question 2.2 in the Drilling Contractor SSI (Appendix 1.6), Fig 5.3.3 schematically displays the differing tendering orientations of both Major and Independent. In each case, the length of the arrow represents the magnitude of the orientation relative to the equidistant point. The long arrow for the Major (Fig 5.3.3) reflects its strong formally based approach (Table 5.3.6).

Position on the spectrum between a Formal approach & a Relationship based approach of the Operators Contractual Tendering Selection Procedure							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Independents	7	3.57	4	Multiple modes exist	1.27	2	5
Majors	7	2.29	2	2	0.95	1	4
Note: On spectrum 1 = Formally based, 7 = Relationship based, 4 = Equidistant point							

Table 5.3.6

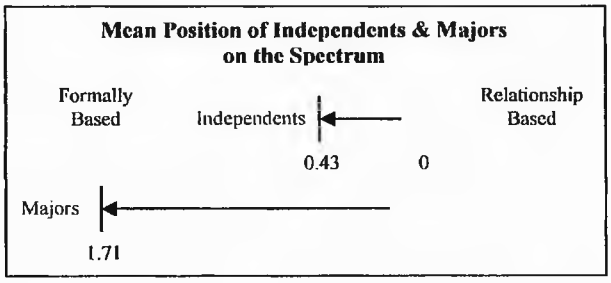


Fig 5.3.3

As previously noted, the tendering process was the most frequently specified operation where the decision-making speed of Independents was faster than Majors. This thesis finds that Independents' tendering procedures are less formalized relative to Majors, which is concurrent with Wally and Baum's (1994) formalization results and assists in explaining the decision-making speed differential for this activity. The low formalization of the Independents' tendering selection procedure explains why decision-making speed for this activity is faster. Contractors B, C, D, and G all identified formalization, in the form of paperwork, to be a primary cause of the slower decision-making of Majors relative to Independents (see Table 5.3.5).

5.3.1.1 Spectrum of Consultation

Answers to questions 1.8 & 1.10 which relate to the spectrum of consultation (see Appendix 1.2), demonstrate that the number of personnel consulted to enact a given decision varies widely according to the particular Independent (see Fig 5.3.4 and Fig 5.3.5). This variation is notable when one considers that differing firms apply differing numbers of people in order to make the *same* decision. In this thesis, the two key decisions analysed are, firstly, the decision to drill a test-well, and secondly, the decision to resolve a particular technical scenario. Both decisions are strategic in nature and require the 'commitment of substantial resources at the level of the total enterprise' (Wally and Baum, 1994, p.933). Beginning with the test-well decision, the histogram of the number of personnel consulted (Fig 5.3.4), shows most firms' consultation process involved between 4 and 16 personnel[10]. Examination of the data on key personnel consulted indicates that Finance personnel were the most frequently consulted (13/13) (Table 5.3.7). Thereafter, consultation was most frequently made with the Exploration / Geology and Geophysical personnel (11/13). Next in frequency, was the consultation made with Implementation personnel (10/13), of the Operations, Drilling, and Production departments. Finally, Engineering personnel were also frequently consulted (9/13). For all firms (13/13) a Board Director was involved, typically the Chief Executive Officer. Overall, these results provide additional support to the central importance that the Finance function has within Independent firms (see Section 6.2).

[10] It is of note that the outlier observation of 25 personnel consulted was the response of the largest firm in the sample, Independent N. Thus larger Independents may display the organizational disability of some Majors.

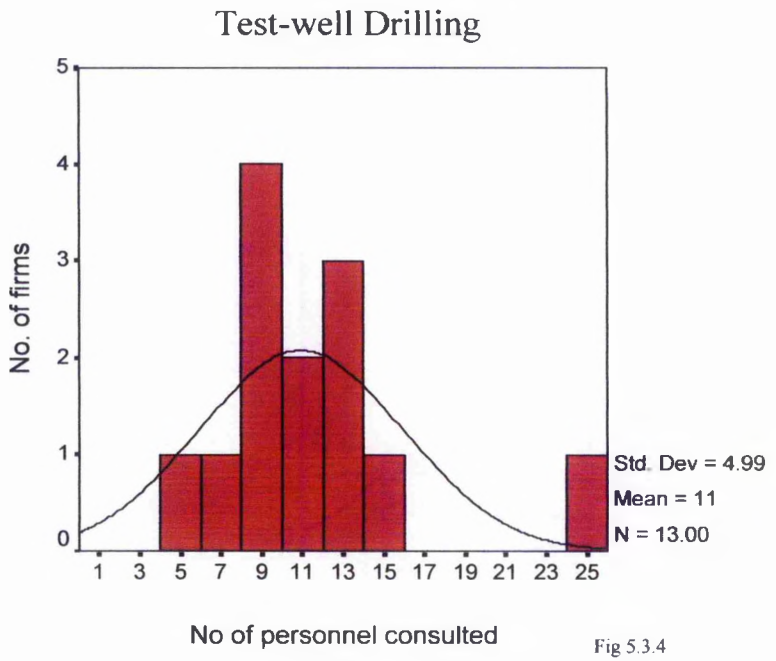


Fig 5.3.4

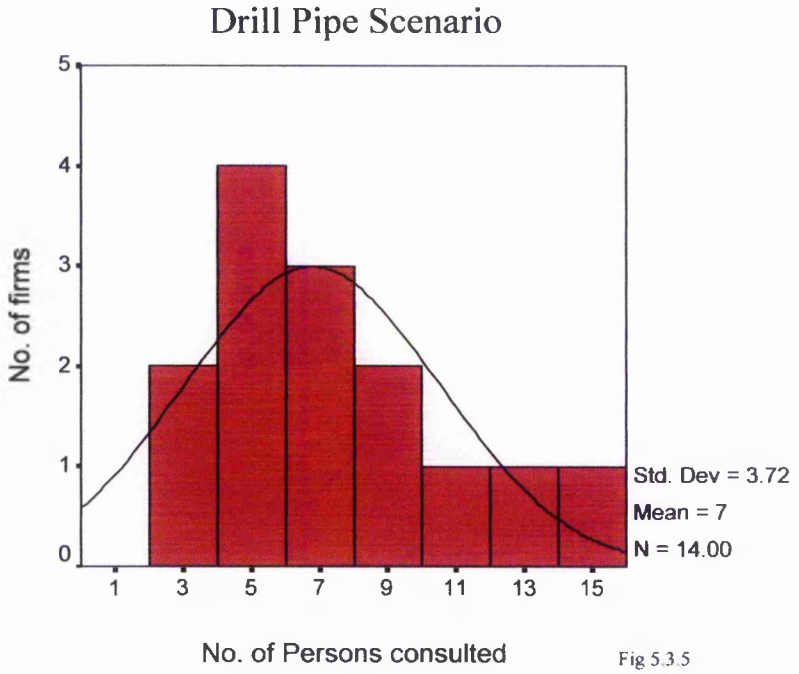


Fig 5.3.5

Question 1.8
Personnel Consulted Prior to the Execution of a test-well drilling.

		The Key Personnel Consulted:										
Independent	*No. of Personnel Consulted*	*Executive* (Chairman, Directors, Non-Exec)	*Exploration / Geology & Geophysics*	*Finance*	*Corporate Development*	*Engineering*	*Operations*	*Drilling*	*Production*	*Security*	*Legal*	*HSE*
B	9	1 = Director 3 = Non-Execs	1 = Exploration Manager	1 = Finance Manager 1 = Financial Advisor (Out-house) 1 = Stockbroker (Out-house) 1 = Key Shareholder (Out-house)								
C	9	4= Board Persons 1=CEO	1= Exploration Manager	1=Finance Director		1= Manager (Reservoir & HSE)	1 = Operations Manager					
D	10	1=Chairman 1=COO	1 = G&G consultant (Out-house)	1=Finance Manager			1 = Operations Manager	1=Drilling Manager 1 = Drilling Manager (Out-house)	1 = Production Manager	1 = Security Manager	1= Legal Consultant (Out-house)	
E	6	1=Chairman 1=CEO 2=Board Persons	1=Exploration Manager	1=Finance Director								
F	5	1=CEO	1=Geologist 1=Geophysicist	1=Finance Manager		1=Reservoir/Petroleum Engineer						
G	7	1=CEO	1=Geologist (Out-house) 1=Geophysicist (Out-house)	1=Finance Director		1 = Reservoir Engineer (Out-house)	1=Technical Director	1 = Drilling Manager (Out-house)				

Table 5.3.7

Question 1.8
Personnel Consulted Prior to the Execution of a test-well drilling.

		The Key Personnel Consulted:									
Independent	*No. of Personnel Consulted*	*Executive* (Chairman, Directors, Non-Exec)	*Exploration / Geology & Geophysics*	*Finance*	*Corporate Development*	*Engineering*	*Operations*	*Drilling*	*Production*	*Legal*	*HSE*
H	12	1= CEO		1=Finance Director 1=Commercial VP 1= Financial Controller	1=Project Development VP		1=COO			1 = Legal Advisor (Out-house)	
I	14	1=CEO	1=Geologist 1=Geophysicist	1=Finance Director 1=Finance Manager	1=Corporate Development	1=General Manager Reservoir 1=Reservoir Engineer	1=COO 1 = Operations Manager	1=Drilling Manager	1=Asset Manager 1= Well Performance Manager 1=General Manager		
J	8	1=CEO	1=Geoscience Manager 1=Exploration Manager	1=Finance Director 1=Commercial Manager		1=Petroleum Engineer	1=Technical Director 1=Operations Manager				
K	12	1=CEO		1=Financial Director 1=Commercial Director		1=Reservoir / Petroleum Engineer	1=Technical & Operations Director 1=Technical Manager		1=General Manager 1 = Production Engineer	1 = Company Secretary /Legal Manager	
L	13	2=Board	1=Exploration Manager 1=Geologist 1=Geophysicist	4=Commercial Peer Review		2=Reservoir Engineers	2=Senior Managers				
M	11	Board	1=Exploration Dept Head	1=Accounts Dept – Joint Venture Accountant		1= Petroleum & Reservoir Engineering Dept Head		1=Drilling Dept Head			1=Dept Head
N	25	4= Board Directors	1=Geology & Geophysics Dept Head 2=Members of G&G + Dept Staff	1=Finance Dept Head 1=Commercial Dept Head + Dept Staff		1=Petroleum Engineering Dept Head + Dept Staff		1=Drilling Dept Head + Dept Staff			1=Dept Head

Table 5.3.7

Turning to the drill-pipe scenario, Question 1.10 of Independent SSI was found to be a highly practical question; two Independents acknowledged that they had experienced a very similar decision-making situation. Analysis of histogram results reveals, on average, fewer personnel to be consulted for resolution of the drill-pipe scenario (mean = 7 personnel) (Fig 5.3.5), relative to the test-well drilling decision (mean = 11 personnel) (Fig 5.3.4). Examination of the key personnel consulted demonstrates that the Finance (10/13) and Implementation (10/13) personnel were the most frequently consulted (13/13) (Table 5.3.8). A strong representation from the Board of Directors was also present (12/13), with the CEO usually being consulted. Once again, these results point to the central role that the Finance department has in the functioning of the Independent exploration and production company.

Returning to hypothesis 3(a) in Section 3.1.2, repeated below, Table 5.3.9 tests whether results for the drill-pipe scenario permit the acceptance of this hypothesis.

Hypothesis 3(a) - The greater the number of personnel consulted to enact a given decision, the longer will be the time taken to choose a course of action.

The positive correlation between the *Number of personnel consulted* and the *Time taken for the Scenario* (Prob. value < 0.05) (Table 5.3.9), does suggest support of hypothesis 3(a) and rejection of the null hypothesis of no relation between number of personnel and action time. A corollary of accepting hypothesis 3(a) is that the fewer personnel consulted, the shorter the time taken to decide upon a course of action. The process of gathering information from many, as against a few individuals, does have a temporal cost (Olsen, 1981) (see Section 3.1), which is an impediment to speedy action.

Question 1.10
Personnel Consulted to Resolve Scenario

		The Key Personnel Consulted:										
Independent	*No. Consulted*	*Executive* (Chairman, Directors, Non-Exec)	*Exploration / Geology & Geophysics*	*Finance*	*Corporate Development*	*Engineering*	*Operations*	*Drilling*	*Production*	*Legal*	*HSE*	*Logistics*
A	6	1= Chairman 2= Managing Directors	1=Local expert	1=Commercial Manager			1=Technical Manager					
B	2	1=Chairman 1=Managing Director										
C	12	Board	G&G Staff	Finance Staff		Reservoir Engineering	Operations Staff		Management Staff			
D	3	1=Chairman					1=Chief Operating Officer 1=Operations Manager					
E	4	1=Chairman 1=CEO	1=Exploration Manager	1=Financial Director								
F	5	1=CEO	1=Geologist 1=Geophysicist	1=Finance Manager		1=Reservoir / Petroleum Engineer						
G	4						1=Technical Director	1= Drilling Manager (Out-house) 1= Drilling Supervisor (Out-house) 1= Drilling Engineer (Out-house)				

Table 5.3.8

Question 1.10
Personnel Consulted to Resolve Scenario

		The Key Personnel Consulted:									
Independent	*No. Consulted*	*Executive* (Chairman, Directors, Non-Exec)	*Exploration / Geology & Geophysics*	*Finance*	*Engineering*	*Operations*	*Drilling*	*Production*	*Legal*	*HSE*	*Logistics*
H	4	1=CEO 1= Board member		1=Finance Director		1=Chief Operating Officer (COO)					
I	6	1=CEO		1=CFO		1=COO 1= Operations Manager	1= Drilling Manager	1= Asset Manager			
J	8	1=CEO	1=Geoscience Manager 1=Exploration Manager	1=Finance Director 1=Commercial Manager	1=Petroleum Engineer	1=Technical Director 1=Operations Manager					
K	8	1= CEO		1=Finance Director 1=Commercial Director	1= Reservoir Petroleum Engineer	1= Technical/ Operations Director 1= Technical Manager		1=General Manager 1= Production Engineer			
L	11	2=Board	1= Exploration Manager 1= Exploration Co-ordinator 1= Project Geologist 1= Geophysicist	1 = AFE (Authority for Expenditure)			1= Drilling Manager 1= Drilling Manager on Rig				1= Long term contractors
M	7		1= Exploration Dept Manager 1= Senior Geologist 1= Senior Geophysicist	1= Joint Venture Accountant			1= Dept Manager 1= Regional Manager			1= Dept Head	
N	15	4 = Board	1 = Dept Head G&G	1= Dept Head Finance 1= Dept Head Commercial	1=Dept Head Petroleum Engineering	1= Dept Head Technical 1= Country Manager	1= Head Drilling HQ 1= Head Drilling on-site	1= Head Country Assets	1= Dept Head	1= Dept Head	

Table 5.3.8

Comparing Decision-making Speed with Spectrum of Consultation, Firm Size, and Burden of Debt			
Variable *Box ordering:* (Pearson) *-Correlation Coefficient* *- Significance* *- N*	*Time taken for Scenario*	*Variable* *Box ordering:* *-Correlation Coefficient* *- Significance* *- N*	*Time taken for Scenario*
No. of persons consulted (scenario)	.68* .02 11	*Operating Profit*	.20 .56 11
Market Capitalization	.44 .18 11	*Total Head Count*	.44 .18 11
Net Assets	.34 .31 11	*Gearing*	-.06 .86 11
Annual Total Production	.14 .69 10	*Interest Paid / Turnover*	.04 .91 11
Turnover	.19 .57 11		
Note: * p < .05 , ** p < .01			

Table 5.3 9

A linear regression of *Number of personnel consulted (Scenario)* against the *Time taken for the Scenario* provides further support for Hypothesis 3(a) (see Table 5.3.10). Fig 5.3.6 displays a scatter plot of the data and this estimated linear regression. Here y = *Number of personnel* and x = *Time taken.* The equation for the estimated regression is $\hat{y} = 2.79 + 0.64x$. The co-efficient of determination is high at $R^2 = 0.46$, and the F-statistic = 7.76 (Prob. value = 0.02) is highly statistically significant (see Table 5.3.10). The slope coefficient (0.64) is positive and a t-test shows it to be significantly different from zero (t-statistic = 2.786, Prob. value = 0.021). This finding further substantiates the positive relationship between the *Number of personnel consulted (Scenario)* and the *Time taken for the Scenario.* The intercept coefficient (2.79) is also positive, but a t-test does not show it to be significantly different from zero (t-statistic = 1.539, Prob. value = 0.158). This suggests a proportional relationship between the *Number of personnel consulted* and the *Time taken* (intercept coefficient equal to zero). With the intercept coefficient not significantly different to zero, the inference made from such a result, is that it takes zero time to consult zero personnel.

ANOVA of Spectrum of Consultation (Scenario) and Speed of Decision					
Model	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Regression	77.30	1	77.30	7.76	0.021
Residual	89.61	9	9.96		

Table 5.3.10

Linear Regression: Spectrum of Consultation and Speed of Decision.

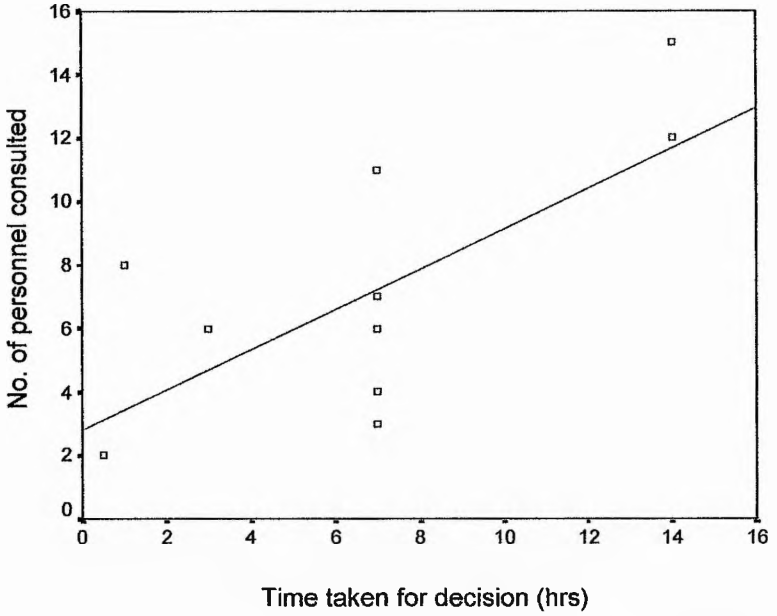


Fig 5.3.6

Table 5.3.9 also tests whether *Firm size*, per se as reported by Wally and Baum (1994), influences decision-making speed. Although the Pearson correlations between most *Firm size*[11] variables and the *Time taken for the Scenario* are of the appropriate positive sign, the Prob. values are all above (0.10). However, closer examination (see Table 5.3.11) suggests that the larger the *Firm size*, the longer the time taken to decide upon a course of action. An independent samples t-test of the mean differences in Head Count (Table 5.3.11), between fast (<1Day) and slow (≥1Day) decision-making firms, confirms this result (t = -2.422; Prob. value = 0.033). The feature which may have prevented this being detected by the above correlation is the limited time scale differentiation by which firms expressed their *Time taken for the Scenario* answers. Firms often expressed their

[11] These variables include: Market Capitalization, Net Assets, Turnover, and Total Head Count.

answer in terms of days, not hours, thereby limiting scale differentiation[12]. This was especially true of those firms that specified decision-making for the scenario would take 1 day. The Scenario results thus suggest, that the larger the size of the Independent, the slower the speed of decision-making.

Comparing Decision-making Speed with Firm Size		
Variable	*< 1Day (< 7hrs)*	*≥ 1 Day (≥ 7hrs)*
N	3	11
Mean Head Count	24.67	164.18

Table 5.3.11

The final relationship for which Table 5.3.9 also tests, is whether an Independent's burden of debt, measured according to *Gearing* or *Interest Paid / Turnover*, influences the speed at which decisions are undertaken. As the results display, no correlation may be established between the *Burden of Debt* measure and the *Time taken for the Scenario*. Thus the findings give no support to the concept that debt related 'financial pressures' (see Section 3.1.4.) are a stimulus to faster decision-making.

For hypothesis 3 (b) (Section 3.1), Table 5.3.12 tests this hypothesis, with respect to the test-well and drill-pipe decisions.

Hypothesis 3(b) - The larger the firm size, the greater will be the number of personnel consulted for making a given decision.

For both 'test-well' and 'scenario' cases results show the firm size measures of *Market Capitalization*, *Net Assets*, and *Head Count* to be positively and significantly correlated with the *Number of Personnel Consulted* (Prob. value < 0.05). These correlations suggest rejecting the hypothesis of no relation between *Firm size* and *Number of personnel consulted*, we accept hypothesis 3(b); namely that the larger the firm size, the greater the number of personnel consulted in order to enact a given decision.

[12] By expressing their answer in a larger unit of measurement, days rather than hours, the likelihood of differentiating between companies was reduced.

Comparing the relationship between the number of personnel consulted and firm size		
Variable *Box ordering:* (Pearson) *-Correlation Coefficient* *- Significance* *- N*	*Test-Well:* *No. of personnel consulted*	*Scenario:* *No. of personnel consulted*
Market Capitalization	.83** .000 13	.73** .003 14
Net Assets	.76** .002 13	.76** .002 14
Annual Total Production	.45 .12 13	.57* .04 13
Turnover	.47 .10 13	.56* .04 14
Operating Profit	.48 .10 13	.58* .03 14
Total Head Count	.595* .032 13	.55* .04 14
Note: * $p < .05$, ** $p < .01$		

Table 5.3.12

Running linear regressions of *Number of personnel consulted (Test-Well and Scenario)* on *Market Capitalization* provides further support for the acceptance of Hypothesis 3(b) (Table 5.3.13 and Table 5.3.14). Table 5.3.13 exhibits the results for the first model, the linear regression between *Market Capitalization* and *Number of personnel consulted (Test-Well)*. Fig 5.3.7 displays a scatter plot of the data and this estimated linear regression, where y = *Number of personnel consulted (Test-Well)* and x = *Market Capitalization*. The estimated regression line is $\hat{y} = 0.025x + 6.81$. The co-efficient of determination, is high at $R^2 = 0.69$, and the F-statistic = 24.71 (Prob. value = 0.000), is highly statistically significant, suggesting the acceptability of this model. The slope coefficient (0.025) is positive and a t-test shows it to be significantly different from zero (t-statistic = 4.971, Prob. value = 0.0004). Similarly, the intercept coefficient (6.81) is positive and a t-test shows it to be significantly different from zero (t-statistic = 5.936, Prob. value = 0.0001).

ANOVA of Spectrum of Consultation (Test-Well) and Market Capitalization					
Model	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Regression	211.53	1	211.53	24.71	0.000
Residual	94.16	11	8.56		

Table 5.3.13

Linear Regression: Spectrum of Consultation (Test-Well) and Market Capitalization.

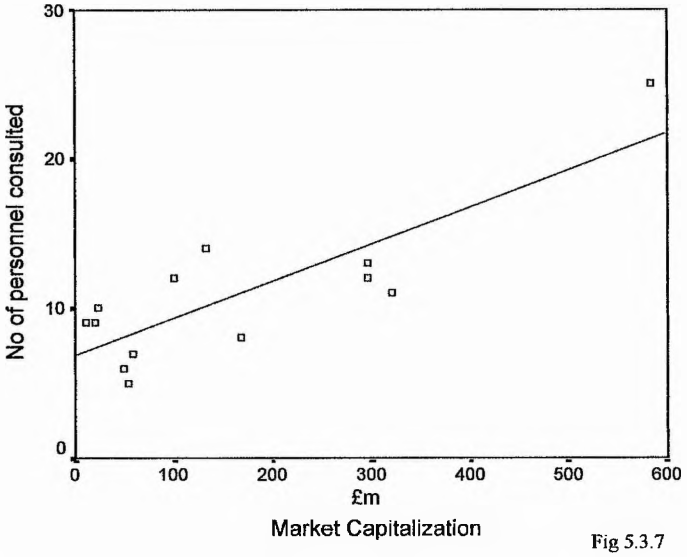


Fig 5.3.7

Table 5.3.14 displays the results for the second model, the linear regression of *Number of personnel consulted (Scenario)* on *Market Capitalization*. Fig 5.3.8 displays a scatter plot of the data and this linear regression, where y = *Number of personnel consulted (Scenario)* and x = *Market Capitalization*. The estimated regression line is $\hat{y} = 4.34 + 0.016x$. The co-efficient of determination is $R^2 = 0.52$, and the F-statistic = 13.26 (Prob. value = 0.003) is statistically significant, suggesting the acceptability of this model. The slope coefficient (0.016) is positive and a t-test shows it to be significantly different from zero (t-statistic = 3.641, Prob. value = 0.0034). The intercept coefficient (4.34) is positive and a t-test shows it to be significantly different from zero (t-statistic = 4.431, Prob. value = 0.0008).

ANOVA of Spectrum of Consultation (Scenario) and Market Capitalization					
Model	*Sum of Squares*	*df*	*Mean Square*	*F*	*Sig.*
Regression	94.68	1	94.68	13.26	0.003
Residual	85.68	12	7.14		

Table 5.3.14

Linear Regression: Spectrum of Consultation (Scenario) and Market Capitalization.

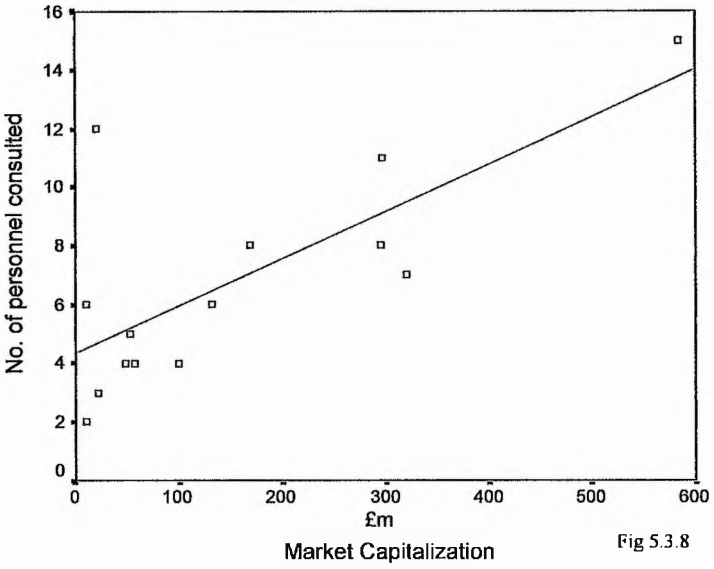


Fig 5.3.8

In accordance with the discussion of Section 3.1.2 (Reid, 1989), the above findings suggest that the larger the Independent, the greater the horizontal specialization exhibited[13] (Mintzberg, 1981). Evidence drawn from Tables 5.3.7 and 5.3.8 confirms this suggestion. For example, in both the 'test-well' and 'scenario' cases, only the largest two Independents (Independent M and N), reported inclusion of a specialist HSE (Health, Safety and Environment) head of department in the consultation process. Similarly, increased specialization of the personnel within the larger, relative to the smaller Independents, may also be recognised for exploration departments. Inspection of Table 5.3.7 reveals the smaller Independents to only incorporate an Exploration Manager (Independents B, C, and E), whereas larger Independents incorporate both an Exploration Manager and a Geologist or Geophysicist (Independents J, L, and N). This increased specialization reduces the scope of tasks constituted by an average job. Thus when information necessary for non-routine, strategic decisions[14] is required, it must be gathered from a greater number of sources. As explained in Section 3.1, information is typically generated by individual personnel through application of their particular skills,

[13] To reiterate, Mintzberg (1981) defines horizontal specialization as that which occurs when jobs within the organization increasingly encompass only a few narrowly defined tasks.
[14] Such as the 'test-well' or 'drill-pipe scenario' decisions.

knowledge, and experience. In large organizations, where horizontal specialization is great, the necessary information will be spread across a larger number of individuals. As Table 5.3.10 suggests the greater the number of personnel who hold the necessary information (viz. the larger the *Spectrum of Consultation*), the longer the time taken to gather the information from these sources.

Turning to the third hypothesis of Section 3.1.3, Table 5.3.15 seeks to determine if there is any relationship between the degree of managerial *focus* and the speed of decision-making:

Hypothesis 3 (c) - The greater the degree of focus of a key decision-maker in the organisation, the more rapidly will decisions be made.

Although the relationship between *Time taken for scenario* and *Number of Blocks within Decision-making Jurisdiction of the Key Manager* is of the appropriate sign (-0.25), the Prob. value of 0.47 provides insufficient evidence to reject the null hypothesis of no relationship between these key variables. However, the results of Table 5.3.15 do suggest that the degree of managerial focus is associated with firm size. The firm size measures used were *Net Assets*, *Production*, *Turnover*, and *Operating Profit*. These are all positively correlated with the *Number of Blocks within Decision-making Jurisdiction of the Key Manager* (Prob. value < 0.05). In essence, these results show that the smaller the firm size, the greater the degree of managerial focus. Although, our results do not show managerial focus to be associated with decision-making speed, the research of Gifford (2001a; 2001b; 2001c) would dispute this finding. According to Sharon Gifford, managerial focus does reduce decision delay. I would therefore reason that the faster decision-making speed identified by this thesis for smaller Independents relative to large Independents, may also be influenced by the greater degree of managerial focus in these smaller firms.

Comparing the relationship of Focus to Speed of Decision-making & Action, and Firm Size			
Variable Box ordering: (Spearman's rho) -Correlation Coefficient - Significance - N	*No. of Blocks within Decision-making Jurisdiction of Key Manager*	*Variable* Box ordering: -Correlation Coefficient - Significance - *N*	*No. of Blocks within Decision-making Jurisdiction of Key Manager*
Market Capitalization	.52 .10 11	*Operating Profit*	.72* .01 11
Net Assets	.62* .04 11	*Total Head Count*	.06 .85 11
Annual Total Production 2002	.61* .046 11	*Time taken for scenario*	-.25 .47 11
Turnover	.64* .04 11		
Note: * $p < .05$, ** $p < .01$			

Table 5..3.15

Finally, in seeking to address the serious lack of attention paid by existing decision-making speed research to decision quality (Eisenhardt, 1989; Eisenhardt, 1990 Judge and Miller, 1991; Wally and Baum, 1994), Table 5.3.16 measures the accuracy of the Independents' test-well decisions. Since only 6 firms had drilled 5 or more exploration test wells, their results are displayed in a separate column from those which include the success rate of firms with less than 5 wells drilled. Overall, relative to studies of Majors (Forbes and Zampelli, 2000; Forbes and Zampelli, 2002)[15], both results display a relatively high success rate for British Independents in making commercially successful finds. Indeed, the exploration success rates reported for the British Independents are very similar to those recorded by Forbes and Zampelli (2000 and 2002) for Majors. Thus, the quality of decisions made by Independents, as measured by exploration success rate, appears to be high and close to that of Majors. This finding produces contemporary support for McKie's (1960, p.559) assertion that uncertainty, in the sense of Knight (1921), places the exploration success rates of both Independent and Major on an even footing (see Section 2.1). Table 5.3.16 also suggests exploration success rates are not influenced by the number of wells drilled. An independent t-test of mean difference

[15] As discussed in Section 7.1, the results displayed in Table 5.3.16 concord with the success rates calculated by Forbes and Zampelli (2000; 2002) of 55% (1995) and 55.4% (1998) for US offshore and onshore exploration respectively.

between the categories *5 or more wells* and *less than 5 wells*, was not significant (t-statistic = -0.222, Prob. value = 0.830).

Commercially Successful Finds			
	No. of test wells drilled (excluding appraisal & development)		
Variable	5 or more wells	Less than 5 wells	Including those with less than 5 wells drilled[16]
N	6	4	10
Mean % success rate	56.7	52.1	54.88

Table 5.3.16

5.3.2 Stimulus to Action

Relative Importance of Differing Stimulants to the Hastening of Action							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Cashflow	13	1.23	1	1	.44	1	2
Production targets	13	3.00	3	3	1.29	1	5
Cost of capital	13	3.85	4	4	1.68	1	6
Oil price expectations	13	4.00	4	Multiple modes exist	1.22	2	6
Competitive Advantage	13	4.15	4	Multiple modes exist	1.46	2	6
Government incentives	13	5.08	6	6	1.26	2	6

Table 5.3.17

Table 5.3.17 presents the mean ranked order of the stimuli reported to encourage faster action. The action to be hastened is the time between award of licence and production coming on-line. The stimulus variables were ranked from 1 to 6, with 1 = most important, 6 = least important. The most important stimulus was *Cashflow*. The very low standard deviation (.44), recorded for *Cashflow*, demonstrates the importance placed upon this variable by all Independents. Section 6.1 shows this finding can be explained in accordance with a Net Present Value (NPV) valuation approach. *Production Targets* (mean = 3.00) rank next in importance, demonstrating the power that planning via target setting has to stimulate faster action. Working to a set deadline can hasten action (Parkinson, 1958). Differing from previous reported industry commentary (HCSC, 1988a; see Section 3.1.4), the financial pressure of debt, *Cost of Capital*, was found not to be a primary stimulus to rapid action. In general, action was not stimulated in an effort to reduce the overall cost of carrying debt. Interpretation of this result must be made within the context of the finding that the level of gearing is directly proportional to

[16] Only 10 firms are detailed because two of the interviewed firms had not drilled any exploration wells as Operator, whilst another two did not disclose results.

Independent firm size (see Section 5.1). Section 6.1, adopts a theory of credit rationing (Calomiris and Hubbard, 1990) to explain these results. Returning to the rankings presented in Table 5.3.17, a Friedman test, $\chi^2 = 31.17$, (Prob. value = 0.000), shows that it is highly unlikely that these rankings occurred by chance, and that the variables listed can be ordered by distinct preference. The results displayed exhibit a high level of concordance in the rankings chosen by respondents; Kendall's W = 0.479 (Prob. value = 0.000).

Relative Importance of Differing Stimulants to the Hastening of Action – North American Sample							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Cashflow	11	1.82	2	2	.75	1	3
Production targets	11	2.55	2	Multiple modes exist	1.51	1	6
Competitive Advantage	11	2.64	3	1	1.63	1	6
Cost of capital	11	4.00	4	4	1.10	2	6
Government incentives	11	5.00	5	5	.63	4	6
Oil price expectations	11	5.00	6	6	1.41	2	6

Table 5.3.18

Moving beyond the British Independents, Table 5.3.18 presents the ranked stimuli to action reported by the North American Independents. Like British Independents, North American Independents also reported *Cashflow* to be the most significant factor hastening action (Table 5.3.18). Similarly, *Production Targets* ranked second in importance whilst *Cost of Capital* is also of lesser importance (ranked 4th). The only substantial difference in the rankings between British and North American Independents is the *Competitive Advantage* variable. Ranked 5th in importance by British Independents, it is ranked 3rd in importance by North American Independents. As discussed in Section 6.1, this differential may be attributed to the organizational culture fostered by the North American approach to business. Further supporting the results of Table 5.3.18, a Friedman test, $\chi^2 = 29.03$, (Prob. value = 0.000), shows it is highly improbable that the rankings were derived by chance, and that the variables noted indicate a significant ordering of preference. Results display a high level of concordance in the rankings chosen by respondents; Kendall's W = 0.528 (Prob. value = 0.000).

Relative Importance of Differing Factors that Slow Action							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Block significance relative to partner firms' total portfolio	12	1.92	1.5	1	1.44	1	6
Partner Approval	12	2.42	2.5	3	1.44	1	6
Differing geological interpretations by partner firm(s)	12	3.33	3.5	4	.99	2	5
Delayed capital contribution by partner firm(s)	12	3.5	3.5	Multiple modes exist	1.78	1	6
Delayed drilling by contracting firm(s)	12	4.5	4.5	4	1.09	2	6
Establishing a drilling contract	12	5.33	5.5	6	.89	3	6

Table 5.3.19

Turning to the variables that slow down action, Table 5.3.19 displays the mean rank order of those factors reported to extend the time interval between award of licence and drilling of a first test-well. The most important variable for slowing action was reported to be *Block significance relative to partner firms' total portfolio*. As Section 6.1 explains, this finding verifies the reported consequences which arise when an Operator considers a licence to be Non-Core[17] (Hannon, 2003). Should the Operator of a licence determine it to be of lower potential value, relative to other licences within its company's portfolio, then action upon this 'lesser' licence will likely be delayed. The Operator's other licences receive investment priority. The next most important factor reported to slow action is achieving *Partner Approval*. *Partner Approval* relates to the final process of getting all partners to agree upon a course of action to be undertaken. As Section 6.1 notes, the importance of this factor accords with the work of Eisenhardt (1989), who found the efficacy of dispute resolution to influence the speed of decision-making. A Friedman test, $\chi^2 = 27.67$, (Prob. value = 0.000), shows it is highly unlikely that the rankings in Table 5.3.19 were derived by chance, and that variables indeed express significantly differing preferences. Results display a high level of concordance in the rankings chosen by respondents; Kendall's W = 0.461 (Prob. value = 0.000).

[17] Non-Core acreage is property (a licence) that is no longer considered to strategically fit a company's asset portfolio, and as a consequence, does not normally attract investment from the company (Hannon, 2004).

Relative Importance of Differing Factors that Slow Action – North American Independents							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Differing geological interpretations by partner firm(s)	10	2.4	2	2	1.43	1	5
Block significance relative to partner firms' total portfolio	10	2.6	2	1	1.96	1	6
Delayed drilling by contracting firm(s)	10	3.4	3.5	5	1.84	1	6
Partner Approval	10	3.6	3.5	3	1.35	1	6
Establishing a drilling contract	10	3.9	4	Multiple modes exist	1.20	2	6
Delayed capital contribution by partner firm(s)	10	4.7	5.5	6	1.57	2	6

Table 5.3.20

For North American Independents, Table 5.3.20 displays the corresponding variables which are thought to slow down actions. A Friedman test, $\chi^2 = 10.85$, (Prob. value = 0.055), shows differentiation between rankings (Table 6.3.18) to be weaker than for the previous British Independents. Results display a lower level of concordance in the rankings chosen by respondents; Kendall's W = 0.217 (Prob. value = 0.055). Nevertheless, *Block significance relative to partner firms' total portfolio* continues to be one of the key factors stated to slow down actions.

5.3.3 Rapidity of Action

Table 5.3.21 presents the five variables used to measure the speed of action of Independents. The variables are divided into two groups. In the first group are those measures that relate to exploration drillings where the Independent is in control and holds the position of Operator (Variables: O1, O2, and FD). In the second group, are those measures which relate to the Independent having less control over the timing of action because it only holds the position of Non-Operator (Variables: N1 and N2). Analysis of the results reveals that for both Operated and Non-Operated licences in which Independents are engaged, the action to drill (O1, N1), or develop a licence (O2, N2), is enacted within 2 years. Comparing this interval (≤ 2 year), to the 4 years permitted by

the UK DTI for each activity[18], data suggests Independents to be relatively rapid in their action.

Speed of Action Measures					
Variable[19]	*N*	*Mean*	*Standard Deviation*	*Min*	*Max*
Operator: (O1) Time differential between award of licence & 1st successful test-well (yrs)	9	2	1.12	1	4
Operator: (O2) Time differential between successful test-well & production on-line (yrs)	4	1.75	2.22	0	5
Non-Operator: (N1) Time differential between award of licence & 1st successful test-well (yrs)	11	1.73	1.79	0	5
Non-Operator: (N2) Time differential between successful test-well & production on-line (yrs)	6	1.5	1.05	0	3
Operator: (FD) Time taken for field development decision. (yrs)	8	1.03	0.66	0.25	2

Table 5.3.21

It is interesting to note that for the question 1.1 (see Appendix 1.2), only one Independent (Independent N) reported an unsuccessful well being drilled prior to a successful exploration test well. This result may suggest that in situations where a first test well proved dry, it was unlikely that the Independent, as Operator, would persist with that licence. As discussed in Section 6.1.2.4, this result could be interpreted as the Independent seeking to avert the possibility of 'Gambler's ruin'[20] (McCray, 1975; Newendorp, 1996). Indeed, as is later shown, the possibility of Gambler's ruin is considered more likely for the capital constrained Independent than the deep pocketed Major (Newendorp, 1996).

Table 5.3.21 also displays the average time taken for the *field development decision.* The *field development decision* is the term used to describe the organisational process that is

[18] The DTI's Traditional Production licence consists of an initial term of four years for exploration (O1 and N1), followed by four more years for development to be enacted (O1 and N2) (DTI, 2004).
[19] N is often below 14 because firms varied in whether they had undertaken exploration drilling as Operator, Non-Operator, or both. Likewise some firms had yet to undertake field development as Operator.
[20] Gambler's ruin is the possibility of a long series of chance consecutive losses such that the gambler losses all his money and must drop out of the game. In the context of a failed exploration drilling, one of the approaches to hedge against gambler's ruin is for the company to leave the licence altogether (Newendorp, 1996, p.538).

initiated following a successful exploration drilling. The process is necessary if a field is to be developed and production brought on-line (Kemp, 2003). It involves four principal processes (Kemp, 2003). (1) *Raising financial capital*, as development of a field is more capital intensive than the initial exploration phase (Masseron, 1990). (2) *Reservoir Studies*, as further examination of seismic and test-well information is needed to determine reservoir dynamics. (3) *Contractor negotiations*, as the running of tendering processes is needed in order to select the various required contractors. (4) *Sales arrangements*, to establish to whom, and at what price, the petroleum produced will be sold. During initial inductive research interviews (Kemp, 2003), it was hypothesised that the substantial capital[21] requirements which the field development decision entailed, would be likely to prolong the process for Independents. Examination of the result displayed in Table 5.3.21 does not suggest this, because, on average, British Independents completed the field development decision in just one year. However, when comparison is made with the North American Independents, the British field development decision is relatively slow. Table 5.3.22 displays the North American Independents to take, on average, half the time (6 months) to formulate the field development decision as is taken by British Independents (12 months). An independent samples t-test of mean differences supports this result (t-statistic = 2.169; Prob. value = 0.047). Section 6.1.2.3 investigates possible reasons for this differential.

Speed of Action (yrs) for Field Development Decision: British vs. North American					
Variable	*N*	*Mean*	*Standard Deviation*	*Min*	*Max*
North American Independents Operator: (FDNA) Time taken for field development decision. (yrs)	9	0.45	0.43	0.08	1.5
British Independents Operator: (FD) Time taken for field development decision. (yrs)	8	1.03	0.66	0.25	2

Table 5 3.22

For a breakdown of the activities upon which the British Independents spent field development decision-time see Table 5.3.23. This table displays the greatest percentage

[21] Both monetary and human capital.

of British Independents' time to be spent upon *Sales arrangements* (30%). This is followed by *Contracting negotiations* (21%) and *Reservoir studies* (19%)[22].

Field Development Decision - % of Time spent on particular Activities					
Variable[23]	*Contracting negotiations*	*Raising financial capital*	*Reservoir studies*	*Sales arrangements*	*Other*
N	7	7	7	7	7
Mean	21.19	13.01	19.01	29.76	17.01
Standard Deviation	16.29	13.46	7.71	13.76	15.66
Min	0	0	10	10	0
Max	50	40	30	50	43

Table 5.3.23

In contrast, North American Independents spent their greatest percentage of time on *Reservoir Studies* (41%) (Table 5.3.24)[24]. This is approximately double the proportion of time spent by British Independents on the same activity. Similar to British Independents, among North American Independents *Contracting Negotiations* received the second largest apportionment of time (23%). Whilst *Raising financial capital* was apportioned the least time (1%). This is substantially lower than the proportion of time spent by British Independents (13%) on the same activity. In Section 6.1, it is discussed that this feature is most likely a further consequence of credit rationing (Calomiris and Hubbard, 1990). The larger sized North American Independents have a greater collateral against which a loan may be secured. The greater willingness of lenders to lend to firms with more collateral, may explain the more rapid time taken to raise financial capital for the large North American Independents, than for the small British Independents.

[22] Activities detailed in *Other* category were few, they included: partner approval (10% for Independent I), government regulations (≈30% Independents G & F), environmental regulations (20% Independent C).
[23] Five of the Independents interviewed had never undertaken field development as Operator & two interviewees could not give an accurate break-down of the time spent. Hence N = 7.
[24] Activities detailed in *Other* category were few, they included: facility/engineering design, government regulations, feed study, development options.

Field Development Decision - % of Time spent on particular Activities – North American Independents					
Variable	*Contracting negotiations*	*Raising financial capital*	*Reservoir studies*	*Sales arrangements*	*Other*
N	11	11	11	11	11
Mean	23.02	1.18	41.35	13.77	18.41
Standard Deviation	19.21	3.06	26.93	19.93	21.22
Min	0	0	10	10	0
Max	67	10	90	57	60

Table 5.3.24

On the topic of financial capability, comparison of certain variables for Independent Operated, relative to Independent Non-Operated exploration drilling, reveals the two categories to be quite different (Table 5.3.25). Independents appear to drill fewer appraisal wells when Operator (mean = 0.5), than when acting as a Non-Operating partner in a joint venture (mean = 1.67). An independent samples t-test of mean differences partially supports this result (t-statistic = -1.118; Prob. value = 0.290) Similarly, the mean total water depth in which Independents have undertaken exploratory drilling as Operator (mean = 446.75m), is shallower than the Non-Operated exploration drillings in which they are involved (mean = 612m). Although an independent samples t-test of mean differences does not show this finding to be significant (t-statistic = -0.311; Prob. value = 0.751), the claim that Independents utilise the option of being Non-Operator to access exploration drillings that may exceed their 'Operator' resource capabilities should not be rejected.

Independent Operated vs. Non-Operated Exploration Drilling							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
No. of appraisal wells	6	.5	0	0	.837	0	2
No. of appraisal wells	9	1.67	0	0	2.96	0	9
Water depth (m)	4	446.75	70.5	-	769.10	46	1600
Water depth (m)	8	612	100	-	905.55	5	2590
No. of shareholding partners	8	1.25	.5	0	1.58	0	4
No. of shareholding partners	9	3.11	3	2	1.27	2	5
% shareholding by Independent	9	72.22	86	100	34	7	100
% shareholding by Independent	11	16.5	12	10	11.83	2	37.5

Table 5.3.25

For example, it is interesting to note that for exploration drillings where Independents are Operators, there tend to be fewer additional partners (mean = 1.25), than in drillings where Independents are Non-Operator (mean = 3.11)[25]. An independent samples t-test of mean differences supports this result (t-statistic = -2.691; Prob. value = 0.017). Since Independents appear to undertake less resource-intensive activities as Operators than when Non-Operators (Table 5.3.25), this may explain why fewer additional partners are required. The resources necessary for less complex exploration drillings may be more easily borne by one firm.

Further supporting evidence for the claim that Independents are restricted in their capital resources, may be drawn from the Drilling Contractor Interviews. SWOT analysis revealed *Payment default* to be the greatest threat to a Drilling Contractor of undertaking contracts with Independents (see Fig 5.3.9 and Table 5.3.26).

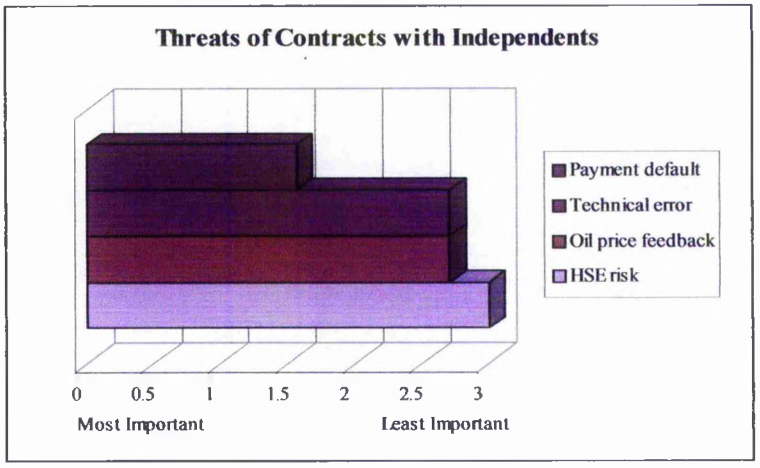


Fig 5.3.9

A Friedman test, $\chi^2 = 5.057$ (Prob. value = 0.168), cannot rule out the possibility that chance may have influenced selection (Fig 5.3.9 and Table 5.3.26). Kendall's W = 0.241 (Prob. value = 0.168), suggests a moderate degree of concordance in the rankings chosen by respondents.

[25] Jim Hannon of HannonWestwood UKCS market intelligence consultancy reports 3 partners are typically involved in a licence. (Hannon, 2004).

Threats of Undertaking a Contract with an Independent							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Payment default	7	1.57	1	1	1.13	1	4
Technical error	7	2.71	3	Multiple modes exist	.76	2	4
Oil price feedback	7	2.71	3	Multiple modes exist	1.11	1	4
HSE risk	7	3	3	4	1.15	1	4

Table 5.3.26

In contrast to Independents, the greatest strength reported by Drilling Contractor interviewees for undertaking contracts with Majors was the financial security conferred. Payments would certainly be made (see Fig 5.3.10 and Table 5.3.27).

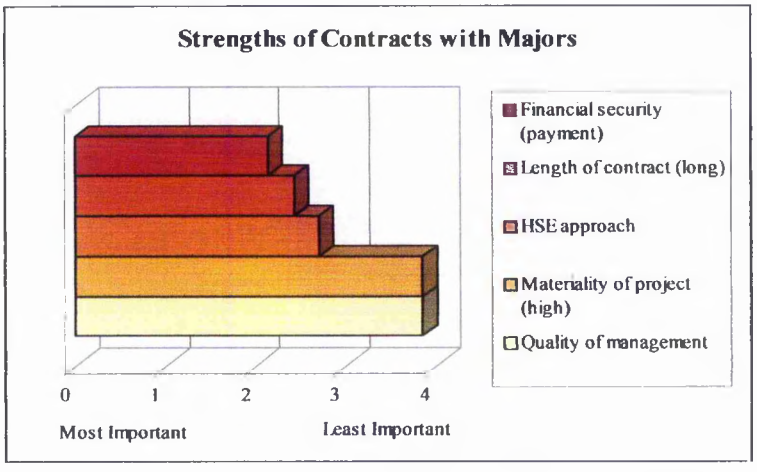


Fig 5.3.10

A Friedman test, $\chi^2 = 7.314$, (Prob. value = 0.120), does not rule out the possibility that chance may have influenced selection (Fig 5.3.10 and Table 5.3.27). Kendall's W = 0.261 (Prob. value = 0.120), suggests a moderate degree of concordance in the rankings chosen by respondents.

Strengths of Undertaking a Contract with a Major							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Financial security (payment)	7	2.14	2	1	1.46	1	5
Length of contract (long)	7	2.43	2	1	1.62	1	5
HSE approach	7	2.71	3	Multiple modes exist	1.11	1	4
Materiality of project (high)	7	3.86	4	4	1.07	2	5
Quality of management	7	3.86	4	5	1.21	2	5

Table 5.3.27

Reviewing the results gathered for Questions 1.1 and 1.4 of the Independent SSI (Appendix 1.2), Table 5.3.28 shows how the above questions have been successful in extracting a relatively even cross-section of the exploration drillings undertaken by Independents. As Table 5.3.28 displays, results in the main, are evenly weighted between offshore/onshore and Western/Non-Western exploration drillings.

Last Successful Exploration Drilling – Sample Distribution (Operator/Non-Operator)				
Variable	*Offshore*	*Onshore*	*Western Countries*	*Non-Western Countries*
N (Operated) Question 1.1	4	5	5	4
N (Non-Operated) Question 1.4	7	4	6	5

Table 5.3.28

For Operated exploration licences, no Independent firm-size measures were found to correlate with either the total depth of the successful well or the water depth in which drilling was undertaken. Small Independents were equally likely to drill wells of a similar depth to those of larger Independents. Indeed, the deepest well recorded within the sample (5334m), was undertaken by one of the smallest Independents, Independent D. Since both well depth and water depth may be recognised as measures of drilling complexity (Campbell and Laherrere, 1998), the previous results suggest no difference in the complexity of exploration drillings undertaken by British Independents of differing firm size. Although larger Independents undertake more licences (Table 5.3.29), the average complexity of an exploration well, measured according to total well depth and water depth, appears to be similar to those of smaller Independents.

Spearman's rho Correlations - Comparing Firm Size with Total No. of Licences Held					
Variable Box ordering: - Correlation Coefficient - Significance - N	*Market Capitalization (£m)*	*Annual Total Production (boepd)*	*Net Assets (£m)*	*Turnover*	*Operating Profit*
Total No. of Licences	.55* .02 17	.48 .06 16	.54* .03 17	.58* .02 17	.61** ..009 17
Note: * $p < .05$, ** $p < .01$					

Table 5.3.29

Before testing hypothesis 3(d) and 3(e) set in Section 3.1, it is important to test whether any other variables may be found to influence the speed of action measures O1, O2 and N1, N2. Tables 5.3.30 and 5.3.31 test the variables of *Water depth*, *Total well depth*,

Number of shareholding partners and the *Number of appraisal wells* drilled and show none of these factors to strongly influence the speed of action measures.

Spearman's rho Correlations – Independent Operated Exploration Drilling						
Variable Box ordering: - Correlation Coefficient - Significance - N	*Operator: (O1)*	*Operator: (O2)*	*No. of appraisal wells*	*Water depth*	*Total well depth*	*No. of shareholding partners*
Operator: (O2)	.50 .50 4					
No. of appraisal wells	-.10 .84 6	.00 1.00 4				
Water depth	.78 .23 4	. . 1	-1.0 1.0 2			
Total well depth	-.19 .66 8	-.50 .67 3	-.35 .56 5	.50 .67 3		
No. of shareholding partners	.32 .44 8	.83 .17 4	.00 1.00 5	1.00** . 4	.02 .97 7	
% shareholding by firm	-.40 .28 9	-.83 .17 4	-.51 .30 6	-.80 .20 4	.20 .63 8	-.95** .00 8
Note: * p < .05 , ** p < .01						

Table 5.3.30

Spearman's rho Correlations – Independent Non-Operated Exploration Drilling						
Variable Box ordering: - Correlation Coefficient - Significance - N	*Non-Operator: (N1)*	*Non-Operator: (N2)*	*No. of appraisal wells*	*Water depth*	*Total well depth*	*No. of shareholding partners*
Non-Operator: (N2)	-.08 .89 6					
No. of appraisal wells	.06 .88 9	-.07 .90 6.				
Water depth	.27 .52 8	.80 .20 4	.45 .31 7			
Total well depth	.43 .19 11	-.35 .49 6	.41 .27 9	-.26 .54 8		
No. of shareholding partners	-.48 .19 9	.65 .24 5	.43 .29 8	-.03 .95 7	-.44 .24 9	
% shareholding by firm	.05 .89 11	-.97** .00 6	-.36 .35 9	-.24 .57 8	.27 .42 11	-.728* .03 9
Note: * p < .05 , ** p < .01						

Table 5.3.31

Likewise, a series of independent samples t-tests do not demonstrate any significant difference in the mean time taken for an action onshore relative to the equivalent mean time taken for the same action offshore (Table 5.3.32).

Testing the Difference in the Mean Time taken Onshore vs. Offshore						
Action	*Variable*	*N*	*Mean*	*Standard Deviation*	*t-statistic*	*Prob. Value*
Operator (O1): Time taken between award of licence & 1st successful test-well	Onshore	5	2.20	0.84	0.57	0.58
	Offshore	4	1.75	1.50		
Operator (O2): Time taken between successful test-well & production on-line	Onshore	3	2.00	2.65	0.33	0.78
	Offshore	1	1.00	1.00		
Non-Operator (N1): Time taken between award of licence & 1st successful test-well	Onshore	4	2.00	1.83	0.36	0.72
	Offshore	7	1.57	1.90		
Non-Operator (N2): Time taken between successful test-well & production on-line	Onshore	3	1.33	0.58	-0.35	0.74
	Offshore	3	1.67	1.53		

Table 5.3.32

From these results the only relationship which seems worthy of further examination is that between the *% shareholding of the joint venture held by the Independent* and *N2* (see Table 5.3.31). The result suggests that the larger the Independent's % shareholding when Non-Operator, the shorter the time between a successful exploration drilling and production coming on-line (Prob. value = 0.00).

We have found none of the other variables examined (for example, *Water depth, Total well depth, Offshore/Onshore*) influenced the speed of action measures[26]. The hypotheses 3 (d) and 3 (e), as shown below, may now be tested.

Hypothesis 3 (d): The smaller the Operating firm, the shorter the time between award of licence and drilling of the first exploration test-well.

Hypothesis 3 (e): The smaller the Operating firm, the shorter the time between a commercially successful exploration test-well find, and production coming on-line.

Table 5.3.33 displays the test results for Hypothesis 3 (d) and 3 (e). The results show that a strong relationship cannot be found between the firm size (*Market Capitalization, Net Assets, Total Production, Turnover, Operating Profit, Head Count*) and speed of action measures (*O1, O2, FD, N1, N2*). Thus the results do not suggest the rejection of the null hypothesis for either hypothesis 3 (d) or 3 (e). However, closer examination of the

[26] Although this suggests that these factors are of no influence, it must be acknowledged that there could be some forms of joint influence at work.

results reveals that for those speed of action measures where the Independent is in control through being the Operator (O1 and O2), a partial relationship may be identified. The majority of the coefficients between firm size variables and the rapidity of action measures O1 and O2, display a positive sign (Table 5.3.33). Overall, these results suggest that as the size of the Independent firm increases, speed of action slows. Such a finding does correspond with similar conclusions drawn by Chen and Hambrick (1995) for the US airline industry.

Spearman's rho Correlations - Comparing Firm Size with Speed of Action					
Variable Box ordering: -Correlation Coefficient - Significance - N	*Operator: (O1)*	*Operator: (O2)*	*Operator: (FD)*	*Non-Operator: (N1)*	*Non-Operator: (N2)*
Market Capitalization (£m)	.16 .69 9	.95 .05 4	-.19 .66 8	.09 .79 11	-.24 .65 6
Net Assets (£m)	.4 .29 9	.95 .05 4	.04 .93 8	-.10 .76 11	-.24 .65 6
Annual Total Production 2002 (boepd)	.24 .56 8	.32 .68 4	-.15 .73 8	.13 .72 10	-.53 .28 6
Turnover (£m)	.22 .57 9	.95 .05 4	-.31 .48 8	.13 .71 11	-.03 .96 6
Operating Profit (£m)	.31 .42 9	.63 .37 4	-.27 .52 8	-.01 .98 11	-.41 .42 6
Total Head Count	-.18 .64 9	.32 .68 4	-.17 .68 8	-.29 .40 11	-.59 .22 6
Note: * p < .05 , ** p < .01					

Table 5.3.33

Turning to the *Field development decision,* similar to the above discussion, a strong relationship cannot be found between firm size and the time taken to formulate the field development decision (FD) (Table 5.3.33). Nevertheless, closer inspection does reveal the majority of coefficients do display a negative sign. In aggregate this suggests that the larger the firm size, the shorter the time taken to formulate the field development decision. This partial finding supports one of the hypotheses generated during initial inductive research (Kemp, 2003), that the resource intensive field development decision might bear more heavily upon small, relative to larger sized Independents. The proposed consequence (Kemp, 2003), that the below findings partially support, is that the time

taken to execute the field development decision would be longer for the smaller Independents.

Returning to the issue of whether a company's burden of debt may stimulate faster action, Table 5.3.34 gauges the relationship between the companies' debt measures and speed of action measures. Since no strong relationships may be detected between the burden of debt and the actual speed of action undertaken by individual Independents, these findings reinforce previous results that would assign a low importance to the financial pressure of debt as a stimulus to action (see Table 5.3.17).

Spearman's rho Correlations – Comparing Stimulants with Speed of Action		
Variable Box ordering: -Correlation Coefficient - Significance - N	*Gearing*	*Interest paid /Turnover * 100*
Operator: (O1)	.22 .46 9	-.04 .91 9
Operator: (O2)	.78 .16 4	-.32 .68 4
Operator: (FD)	-.29 .35 8	-.56 .15 8
Non-Operator: (N1)	.13 .61 11	.20 .55 11
Non-Operator: (N2)	-.32 .41 6	-.73 .10 6

Table 5.3.34

Although in this latter section (Section 5.3.3), significance levels are often low the research has highlighted that the question design framework for measuring action (see questions 1.1 and 1.4 of the Independents SSI) is of a format and content that would provide a useful template for extracting data from historical government records. This would enable the relationships detailed above to be more comprehensively tested. Nevertheless, our own sample still produces findings that assist the overall exploratory nature of this research.

A final feature that may assist in explaining Independents' propensity towards rapidity of actions pertains to company growth targets. Although firms frequently set internal production targets, few indicated these publicly, only 28.6% of the sample so doing. For those disclosing, growth rate targets were high; future production targets implied year on year production growth rates of 57.2%, 145%, and 216% respectively. Unfortunately, few firms would disclose internal production targets. Thus, the above three act as glimpses of the actual growth rates Independents seek to achieve.

5.4 UTILISATION OF CONTRACTORS

5.4.1 Sourcing of Functions

5.4.1.1 Functions Provided In-House

For each Independent, Table 5.4.1 displays how twenty-five separate operational functions are sourced. Provision of these functions falls into one of three categories: (1) Fully provided in-house, (2) Mixed provision provided both internally and externally out-sourced, and (3) Fully out-sourced. Employing these category numbers as codes (for example 1 = in-house to 3 = out-house) Figure 5.4.1 displays how the average Independent sources each particular function. In this chart, the lower the coding, the greater the tendency for a function to be internally sourced. Analysis of Table 5.4.1 and Figure 5.4.1 reveals that the four predominant strengths of Independents lie within the functional categories of Financial, Commercial, Human Resource Management, and Procurement. Explanations as to why it is these functions that are sourced internally, can be drawn from the contrasting transaction-cost and resource-based frameworks. As noted in Section 6.2, following Williamson's transaction-cost interpretation, human asset specificity and frequency of transaction, would be the likely causes of internalisation in this circumstance. Alternatively, in accordance with Richardson's resource-based theory, the four activities can be grouped together as, *similar*, value orientated functions of the business. Unlike other functions, these activities are less technically specialised and more general in their scope, their emphasis being upon value-generation, through deal making and skilled managerial co-ordination. Moving to the more technically specialised functions, such as Petroleum Engineering, Reservoir Engineering, and Seismic Analysis, it is interesting to find these functions to be of both in-house and mixed provision. Following Williamson's framework, human asset specificity appears the most applicable. A level of sustained internal capability is required if the firm is to maintain a store of knowledge about its long-term assets. Moreover, when external providers are sought, a level of internal expertise will enhance a firm's ability to assess contractors and reduce the likelihood of adverse selection. From a resource-based perspective, these functions could be recognised as requiring *similar* capabilities; all require technical knowledge of petroleum/reservoir dynamics (See Section 6.2). Examining the functions of predominantly mixed provision, namely Project and Facilities Management, their partial

Sourcing of Functions

I = in-house M = mixture (sometimes in-house; sometimes contracted out) O = exclusively contracted out

Independent	Commercial	Financial	Procurement	Seismic survey	Data Management	Seismic analysis	Project management	Drilling equipment/ vessels	Drilling personnel	Facilities management	Maintenance services	Subsea design	Subsea fabrication	Diving personnel equip' / vessels
A	I	I	O	O	M	M	O	O	O	M	O	O	O	O
B	I	I	I	M	I	I	I	O	M	I	I	O	O	O
C	I	I	I	O	I	M	M	M	O	M	M	O	O	M
D	I	I	I	O	M	O	M	O	M	M	O	O	O	O
E	I	M	M	O	I	M	M	O	M	M	O	O	O	O
F	I	I	M	M	M	I	M	O	O	O	M	O	O	O
G	I	I	I	O	M	O	I	O	O	M	M	O	O	O
H	M	I	I	O	O	O	O	O	O	I	O	O	O	O
I	M	I	I	O	M	I	I	O	O	M	O	M	O	O
J	I	I	M	O	M	I	M	O	O	O	O	O	O	O
K	I	I	O	O	M	M	M	O	O	O	O	O	O	O
L	I	I	M	M	M	M	M	O	M	M	O	O	O	O
M	I	I	I	O	M	M	M	O	M	M	M	O	O	O
N	I	I	I	O	M	M	M	O	M	M	M	M	O	O

Independent	Petroleum engineering	Reservoir engineering	Design & development engineering	Mechanical engineering	Process engineering	Pipeline engineering	Pipes/ pipe handling equipment	Pipe laying	Health, safety, environment	Human resource management	Software & system engineering
A	O	M	O	O	O	O	O	O	M	I	O
B	M	M	O	M	O	O	O	O	I	I	O
C	M	I	M	M	O	O	O	O	I	I	O
D	M	M	O	M	O	O	O	O	M	M	O
E	M	M	O	O	O	O	O	O	O	O	O
F	I	I	O	O	O	O	O	O	M	I	O
G	M	M	M	O	M	I	I	I	O	I	O
H	M		O	O	O	O	O	O	M	I	O
I	I	I	M	O	O	O	O	O	I	M	M
J	I	I	O	O	O	O	O	O	I	M	M
K	M	M	M	O	O	O	O	O	I	I	M
L	M	M	M	O	O	O	O	O	M	I	O
M	M	M	M	M	M	M	O	O	M	M	M
N	I		M	M	M	O	O	O	I	I	M

Table 5.4.1

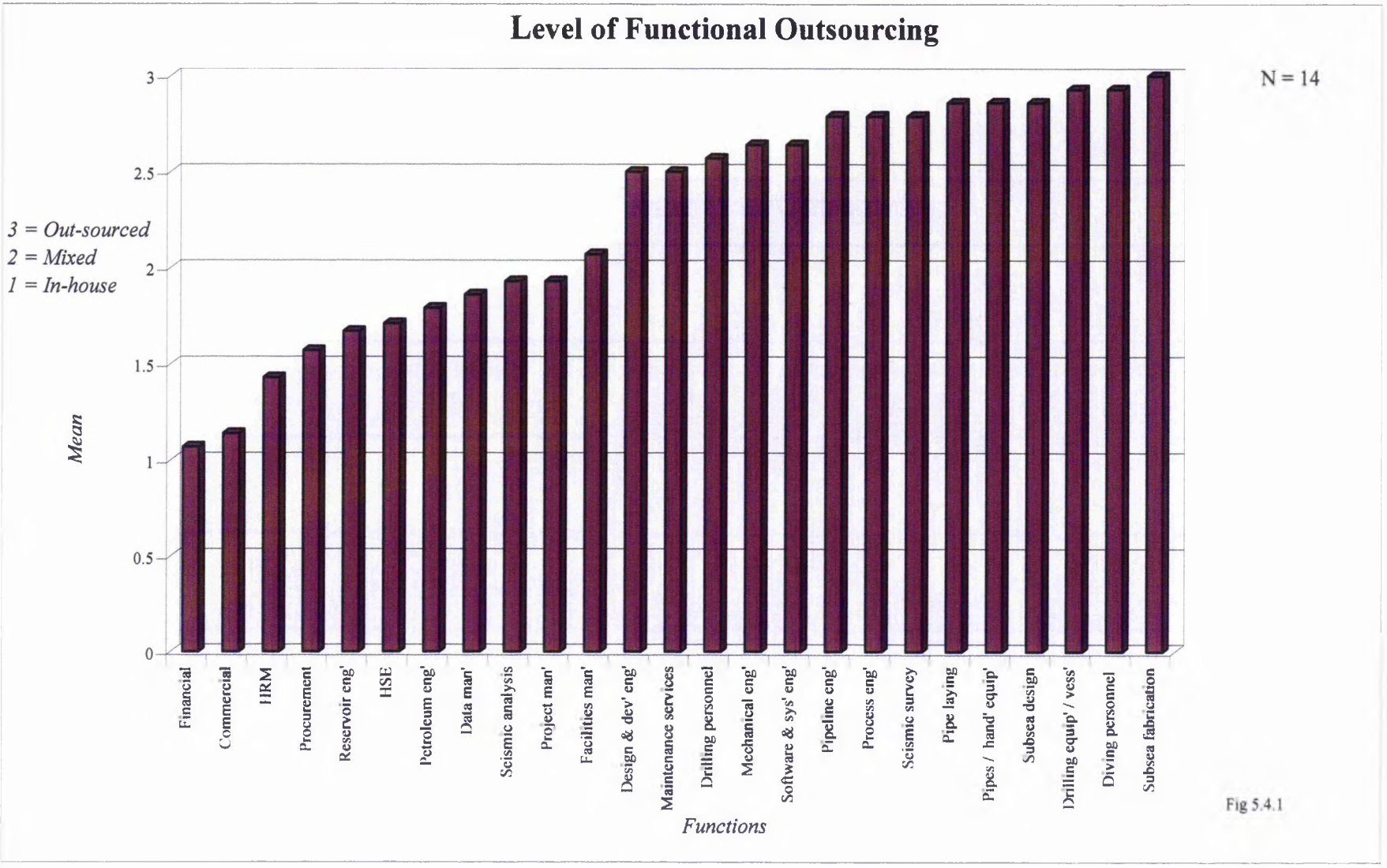

Level of Functional Outsourcing
N = 14
3 = Out-sourced
2 = Mixed
1 = In-house
Mean
3
2.5
2
1.5
1
0.5
0
Financial
Commercial
HRM
Procurement
Reservoir eng'
HSE
Petroleum eng'
Data man'
Seismic analysis
Project man'
Facilities man'
Design & dev' eng'
Maintenance services
Drilling personnel
Mechanical eng'
Software & sys' eng'
Pipeline eng'
Process eng'
Seismic survey
Pipe laying
Pipes / hand' equip'
Subsea design
Drilling equip' / vess'
Diving personnel
Subsea fabrication
Functions

Fig 5.4.1

internalisation could be interpreted as a consequence of uncertainty. When contracted out, both of these functions are found to be critical to an Independent's performance (see Table 5.4.2). Holding such a position of importance, the need for closer monitoring of the contractor, with the aim of reducing uncertainty, may stimulate the Independent to hold some internal expertise. From a Richardsonian perspective, the two functions can also be recognised as requiring *similar* capabilities. Each of the functions relates to the monitoring and control of action, the overseeing of the drilling or production work being undertaken. Overall, as discussed in Section 6.2, both interpretative frameworks appear applicable.

5.4.1.2 Out-Sourced Functions

The remaining functions, of mainly out-sourced provision, may be grouped accordingly. They fall into the categories of Drilling (Equipment, and Personnel), Engineering (Development, Mechanical, and Process), Support Services (Maintenance, and Information Technology), Subsea Operations (Design, Fabrication, and Diving), and Infrastructure (Pipeline Engineering, Handling and Laying) (Table 5.4.1 & Fig 5.4.1). According to Williamson's transaction-cost interpretation, the out-sourcing of these functions arises because asset specificity, uncertainty, and frequency of transaction are themselves insufficient for internalisation to be enacted. In contrast, a resource-based interpretation, would posit these activities to be *complementary* to those in-house activities referenced in Section 5.4.1.1. Although not *similar* to in-house activities, yet acting as *complementary* to the process of production, it is within these functions, according to Richardson, that co-operative possibilities lie.

Analysis of Table 5.4.2, which displays the out-sourced functions upon which each Independent firm's performance is most dependent, reveals the categories of Drilling, Engineering, and Subsea to be of importance. However, the contracted function upon which the performance of Independents is most clearly dependent is Drilling. Results show that regardless of firm size, Drilling is the most important function upon which firms are dependent. Holding such primacy to Independents' performance, Section 5.4.2

investigates the topic of incentivisation and the manner in which contracts with Drilling firms are managed.

Functions provided by the Contracting Firms upon which Independents' Performance is most Dependent					
	1st – 5th in Order of Decreasing Dependence				
Independent	1st	2nd	3rd	4th	5th
A	Infrastructure	Drilling	Facilities management		
B	Data management	Petroleum / reservoir engineering		**Public & investor relations**	Lawyers
C	**Project management**	Drilling	Logging / wireline services	**Logistics**	Logging / wireline services
D	Drilling			Logging / wireline services	Lawyers
E	Drilling	Drilling	**Cementing / stimulation**	Logging / wireline services	
F	Drilling	Petroleum / reservoir engineering			
G	Subsea construction	Drilling	Drilling services	Facilities design construction	Facilities design construction
H	Drilling services	Subsea construction	Facilities design construction	**Pipelaying**	
I	Drilling	Subsea construction	Subsea construction	Subsea construction	Facilities management
J	Facilities management	Drilling	Seismic survey & processing	Seismic processing	**IT**
K	Facilities management	Petroleum / reservoir engineering	Drilling	Drilling	Logging / wireline services
L	Drilling	Drilling	Logging / wireline services	Logging / wireline services	Seismic processing
M	Facilities management	Seismic processing			
N	Facilities management	Drilling	Drilling	Drilling	Drilling

Table 5.4.2

Beyond Drilling, closer examination reveals, the next most influential function upon Independent performance is Facilities Management of production operations. This function is particularly important among the larger Independents (J, K, M, and N). It involves the task of managing a production platform from which production is brought on-line. An interesting finding regarding this function was that the greater the percentage of an Independent's total production within the UKCS, the greater the extent to which Facilities Management was contracted out (Spearman's rho correlation coefficient = 0.599; Prob. value = 0.038). Drawing from Williamson's writings (1985, p.96), Section 6.2.7 demonstrates the level of asset specificity experienced by a firm is also determined in relation to market provision. The more extensive the market provision, the lower the

asset specificity, and the higher the tendency to out-source. Alternatively, Facilities Management also produces findings that are supportive of a resource-based interpretative framework. Findings show that the greater the percentage of its total licences held as Operator, the greater the propensity for Facilities Management to be undertaken in-house (Spearman's rho correlation coefficient = -0.608; Prob. value = 0.028). This result indicates that firms with managerial resources which are adequate for undertaking the co-ordinating task of Operator, are equally involved in the activity of Facilities Management where *similar* co-ordinating resources are required.

5.4.1.3 North American Independents

As displayed in Table 5.4.3, the general pattern of functional sourcing among the North American Independents is similar to that of the British (Table 5.4.1). For example, the British Independent functional strengths of Finance, Commercial, Human Resource Management, and Procurement are all predominantly internalised by the North American firms. Nevertheless, differences occur in the functions of: Seismic Analysis, Data Management, Project Management, Facilities Management, Petroleum Engineering and Reservoir Engineering. Whilst the British Independents in this context utilised mixed provision, the North American Independents mainly internalised these functions. Likewise, the functions of Drilling Personnel, Development Engineering, Mechanical Engineering, Maintenance Services, and System Engineering, which are predominantly out-sourced by British Independents, are mainly of mixed provision with the North American firms. Having established in Section 5.2, that the North American Independent firm size is on average significantly larger than the equivalent British Independent, their greater size may also result in more functions being internalised. The impact of firm size upon the sourcing of functions may also be recognised within our British sample. Inspection of Table 5.4.1 reveals a distinct split between the smaller (A to H) and larger (I to N) British Independents in their provision of both Development Engineering and System Engineering. For each function, the smaller Independents mainly out-source, whilst the larger Independents have mixed provision.

Sourcing of Functions – North American Independents

I = in-house M = mixture (sometimes in-house; sometimes contracted out) O = exclusively contracted out

Independent	Commercial	Financial	Procurement	Seismic survey	Data Management	Seismic analysis	Project management	Drilling equipment/ vessels	Drilling personnel	Facilities management	Maintenance services	Subsea design	Subsea fabrication	Diving personnel equip' / vessels
NA	I	I	I	O	M	O	I	O	I	M	M			
NB	I	I	M	M	M	I	M	O	M	M	O			
NC	I	I	I	O	I	M	I	O	O	I	I	O	O	O
ND	I	I	I	O	I	I	I	O	M	M	O	M	O	O
NE	O	I	M	M	I	M	M	I	I		M	O	O	O
NF	I	I	M	O	I	I	I	O	M	I	M	M	O	O
NG	I	I	I	O	I	O	I	O	O	I	O			
NH	I	I	I	O	I	I		O		I				
NI	I	I	I	O	M	I	I	O	M	I	I	M	O	O
NJ	I	I	I	O	I	I	I	M	I	M	O	O	O	O
NK	I	I	I	O	I	I	M	O	M	M	M	O	O	O
NL	I	I	M	O	I	I	I	O	O	I	O	M	O	O

Independent	Petroleum engineering	Reservoir engineering	Design & development engineering	Mechanical engineering	Process engineering	Pipeline engineering	Pipes/ pipe handling equipment	Pipe laying	Health, safety, environment	Human resource management	Software & system engineering
NA	M	M	O	M	O	O	O	O	I	M	O
NB	I	I	M	O	O	O	O	O	M	I	M
NC	M	I	M	M	O	M	O	O	I	I	M
ND	M	I	M	O	M	O	O	O	I	I	M
NE	I	I	I	M	M	M	M	M	M	I	I
NF	I	I	M	M	M	O	O	O	I	I	M
NG	I	I	I	I	O	O	O	O	I	I	I
NH	I	I				O	O	O	I	I	
NI	M	M	M	M	M	O	O	O	I	I	M
NJ	I	I	I	O	O	O	O	O	I	I	O
NK	I	I	M	M	O	O	O	O	I	I	O
NL	I	I	M	M	M	M	O	O	I	I	O

Table 5.4.3

Reviewing the results gathered from North American Independents concerning the out-sourced function upon which their performance is most dependent (Table 5.4.4), it is clear, that similar to British Independents, Drilling is of greatest importance.

Function provided by the Contracting firm upon which North American Independents' Performance is most Dependent	
Independent	Function Provided
NA	Drilling
NB	Drilling
NC	Seismic survey & processing
ND	Desisgn & development engineering
NE	Drilling
NF	Drilling
NG	Drilling
NH	Facilities management
NI	Not specified
NJ	Facilities management
NK	Design & development engineering
NL	Drilling

Table 5.4.4

5.4.2 Utilisation of Safeguards

5.4.2.1 Governance Structures Sought

Table 5.4.5 lists the four governance structures required by Williamson (2002) if credible contracting is to be achieved under conditions of asset specificity. Independent responses were made in reference to the drilling contractor with whom each firm had the strongest ties. Results for the analysis of governance structures were coded on a scale from 1 = very important to 5 = not important.

Governance Structures sought with Primary Drilling Contractor							
Variable	N	Mean	Median	Mode	Standard Deviation	Min	Max
Information disclosure	13	1.00	1	1	.00	1	1
Penalties for premature termination	11	2.73	2	2	1.01	2	5
Specialized dispute settlement mechanisms	12	3.00	3	2	1.28	1	5
Verification mechanisms	13	1.69	1	1	.95	1	4

Table 5.4.5

Information disclosure, with its attribute of reducing information asymmetries, is the most important governance structure that Independents seek with drilling contractors. All firms stated they aimed to be kept up-dated at all times with the most current drilling developments. Penalties for premature termination, alias incentivisation mechanisms, were of less significance, achieving a *quite important* classification. Extra-legal,

specialized dispute settlement mechanisms, as might be found in the standard form of contract, were not found to be of significance. Indeed, the *indifferent* category of response prevailed. Verification mechanisms, being approaches to determine the actual effort made by contractors, were classified as *quite* to *very important* by most interviewees. Thus results show only a few of Willliamson's governance structures to be applicable to the contracts established between Independents and Drillers.

Entrance into alliances with drilling and/or production operations (facilities management) contractors was found to be minimal (Table 5.4.6).

Alliances with Drilling and/or Production Operations Contractors			
Variable	*N*	*Yes*	*No*
Alliance with Drilling Operations Contractor	14	3	11
Alliance with Production Operations Contractor	14	2	12

Table 5.4.6

For those that did, the rationale supporting alliance formation was diverse. For one firm, Independent E, which had invested in a post-Soviet state, the alliance was not intended. Rather it was a requirement of the deal negotiated that the original State drilling company both maintain a 25% equity in the operations undertaken and be the principal driller for those operations. Independent A had also attempted equity provision with a drilling contractor operating in South America. However, the respondent noted that "any time they had tried to persuade" a drilling contractor to take risk, it "hadn't worked out." In this case, risk sharing contracts were stated to be risky in certain developing countries, because court systems could not be relied upon should the contractor default. For another firm, Independent N, lack of expertise was given as the reason for alliance formation. The service contractor held regional offshore knowledge that the Independent, at the time of the deal, did not possess. A 25% equity stake and cash were taken by the contractor to manage the development of the field and act as production operator. Following a recent acquisition of another exploration firm in the region, Independent N stated this previously contracted out function was now internalised, and the acquisition had conferred on N the necessary skill and experience required. Another Independent (K), stated that the use of production operators arose because the company's

focus was upon "running and developing the business: not implementing operational work programmes". This firm aimed to keep its "core staff low and outsource as much as possible." The reason for outsourcing the production-operator role was because they did not have the necessary "skill set". Moreover, the Independent did not have the "economies of scale" from which the production operator benefited. As for Independent K's choice of production-operator, this was a consequence of "long established relationships with key individuals in the [contracted] organization." In summary, these findings show alliances to be rarely utilised. However, when they are chosen as the method of preference, it is often because the Independent does not possess the necessary resources, and information transfer from the partner-firm is required.

5.4.2.2 Incentivisation

Utilisation of incentivisation systems for governing relationships with drilling contractors had differing incidence. Thus, while 38.5 % of Independents reported no incentivisation, only a day-rate system being employed[1], 61.5% did indeed use some form of incentivisation system (see Fig 5.4.2).

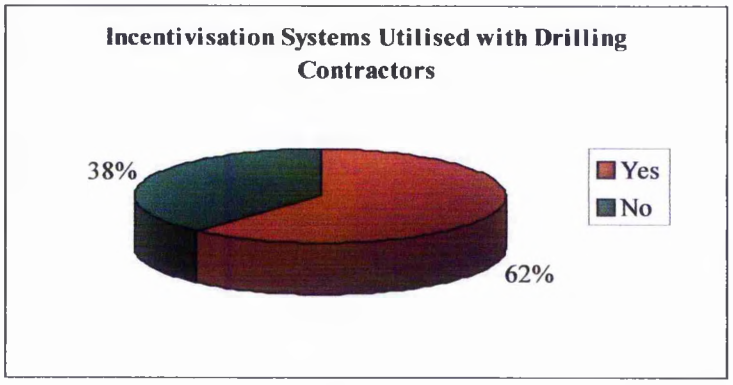


Fig 5.4.2

The bonus system was the most common form of incentivisation, 50% of all Independents detailed its use (Fig 5.4.3). Equity systems and turnkey solutions[2] were

[1] A **day-rate system** means that the drilling contractor is paid a fixed sum for each day of work completed. There are no incentivisation schemes in place. Kemp and Stephen (1997; 1999) have theorised that such a system could be subject to abuse. For it is the field investor, in this case the Independent, which bears the burdens of cost over-runs and delays in work completion.

[2] A **turnkey** solution results in a fixed price being arranged to cover the entire drilling programme before work commences. It essentially acts as a hedge for the Independent and locks it into a known total cost. The cost of over-runs and delays are now borne by the drilling contractor.

less common, utilised by 29% and 17% of firms respectively (Fig 5.4.4-5). No firms were found to utilise either a penalty system or to give a percentage share of field sales.

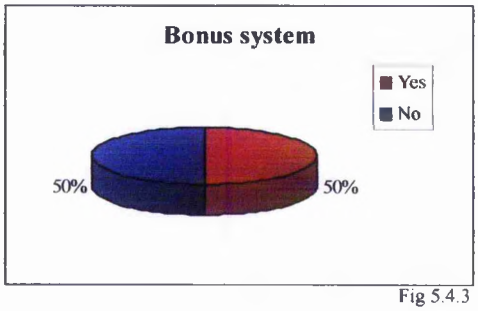


Fig 5.4.3

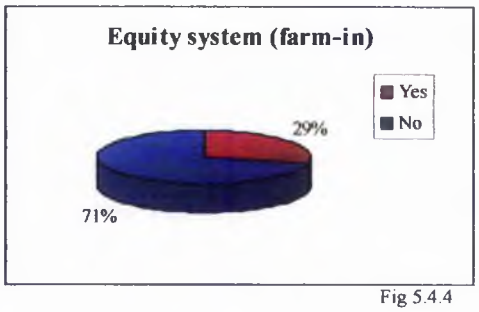


Fig 5.4.4

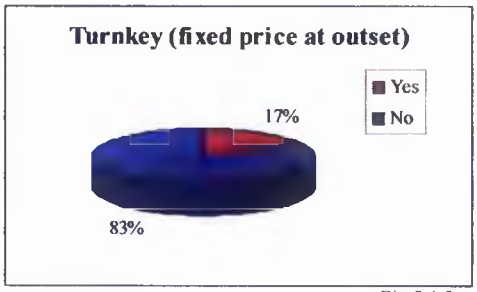


Fig 5.4.5

Of the firms detailing the use of bonuses, all stated the use of budget and time targets (Fig 5.4.6). Output and health and safety targets were of lesser significance, whilst no quality targets were set.

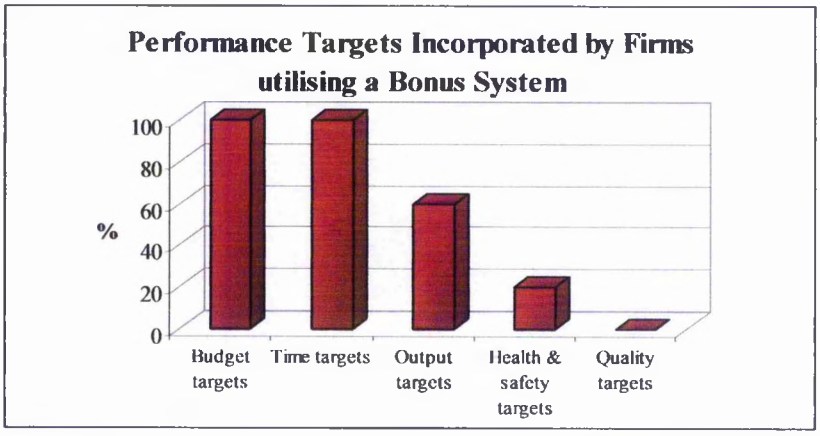


Fig 5.4.6

Incentivisation among North American Independents was resolute, 100% of respondents detailed the incorporation of at least one performance incentive device. As discussed in Section 7.2, this propensity to engage in incentivisation among the North American

companies does concord with Williamson's opportunism based theory and the incentivisation safeguard required for credible contracting.

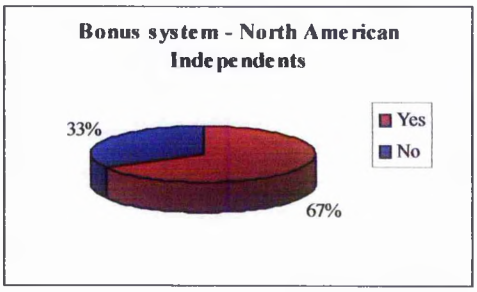


Fig 5.4.7

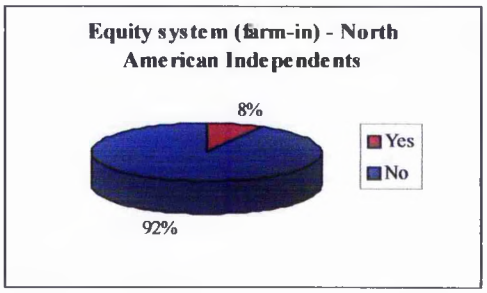


Fig 5.4.8

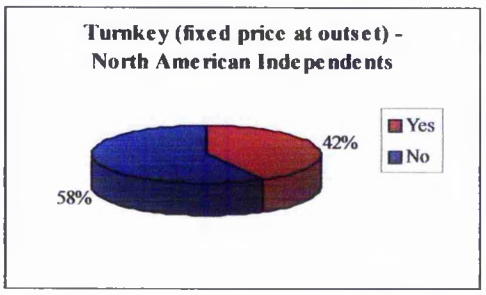


Fig 5.4.9

Similar to British Independents, a bonus system was the most common form of incentivisation among North American firms, 67% of the sample specifying use (Fig 5.4.7). Equity systems were of lesser significance among the North American firms than for British (Fig 5.4.8). In contrast, turnkey approaches were more frequently used, 42% detailing use (Fig 5.4.9). No North American firms were found to utilise either a penalty system or to give a percentage share of field sales.

Comparing the use of incentivisation systems between Majors and Independents, interviews with the International Drilling Contractors revealed that Independents allocated a greater proportion of total project risk to the drilling contractor (see Table 5.4.7).

Operators with whom a Greater Proportion of the Total Project Risk is Typically Allocated to the Drilling Contractor	
Weighting	*Project risk*
Independent	57.1%
Equal	28.6%
Major	14.3%

Table 5.4.7

The most prominent incentive, which induced this risk-transfer, was the turnkey solution. Several respondents noted the turnkey system to be a relatively "common" preference among Independents. Indeed, whilst only 14% of the projects undertaken by drillers, for Majors, had utilised a turnkey system (Fig 5.4.10), the corresponding figure was 29% for Independents (Fig 5.4.11).

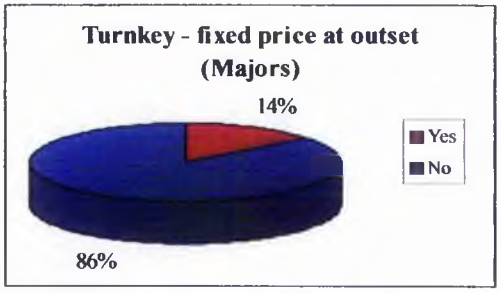


Fig 5.4.10

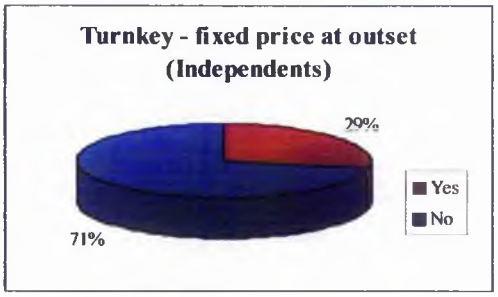


Fig 5.4.11

The explanation given by drillers, as to why the turnkey system was so popular among Independents, was because it "caps their financial exposure", and thereby helps them to gain external finance more easily. Incentivisation schemes transfer risk to the contractor. As a consequence, Kemp and Stephen (1997, p.5) note, small oil companies, with few projects, will experience a significantly greater reduction in risk through implementing such schemes, than will large, diversified companies. This risk reduction may explain the strong popularity of turnkey systems among Independents, as shown by our results.

With the expectation of increased future Independent entrance to the UKCS, Contractor F stated its new policy was to develop a turnkey package. Contractor B already had such a turnkey package in place; its business model was specifically focused upon providing drilling to Independents. Another contractor (C) noted the propensity of the turnkey approach among Independents within the Gulf of Mexico. This latter observation may contribute to Contractor B's preference for such a system, as its primary site of operation was the Gulf of Mexico. Such a finding corroborates our previous results that show turnkey approaches to be more frequently utilised by North American, as against British, Independents.

Although some drilling firms had engaged in penalty systems, all drilling interviewees noted that these systems were rare. As Contractor E stated, a penalty system would only be present in the tender process - to ensure a rig would turn-up on time - but would not be included in the final contract document. Two drillers (A & C) reported their contracts were usually without incentivisation, a simple day-rate being the firms' principal policy. Contractor C acknowledged that his company prided itself in striving to improve drilling performance regardless of incentivisation. Detailed time-depth performance curves were made available to operating clients in order to demonstrate the firm's commitment to continual performance improvement. An example of such a chart is displayed in Fig 5.4.12. In this chart, each coloured line is representative of a different vintage of well (pink, being the oldest well; blue, the most recent well). The chart shows a continual shift of these time-depth curves to the left. Over time, this contractor has improved its performance; greater drilling depths are achieved in fewer days.

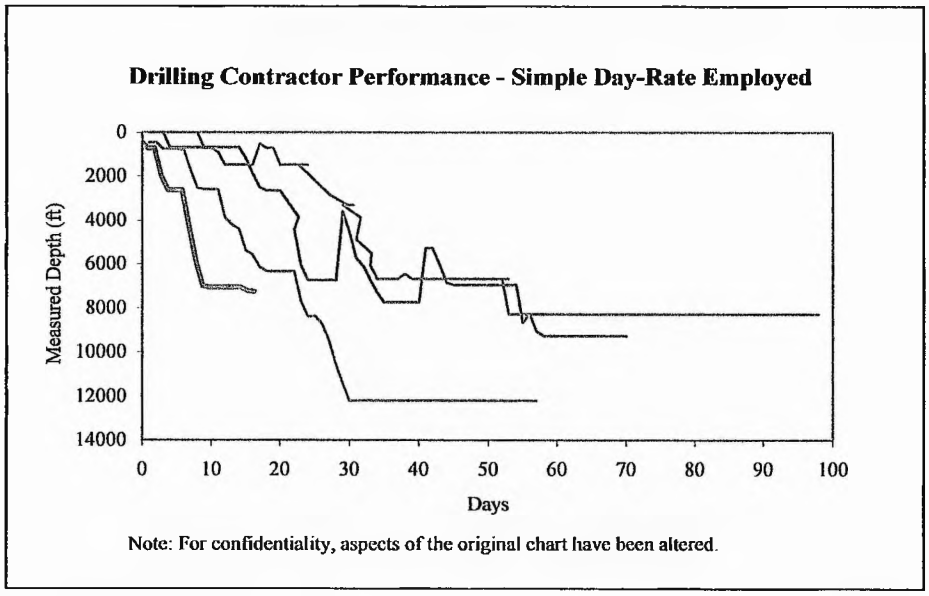


Fig 5.4.12

Contractor C's incentive-free approach juxtaposes Williamson's credible contracting framework. Although open to abuse (Kemp and Stephen, 1997; 1999), i.e. there is no cost to the driller of work being delayed, Fig 5.4.12 shows that, even without incentivisation, drillers can still be trusted to deliver on-time. Thus, adherence to a day-rate system carries with it the connotations of trust and co-operation. It suggests that for

such contracts Richardson's co-operative middle-ground approach provides a more realistic interpretative framework than does Williamson's opportunism based theory.

5.5 NEGOTIATION

5.5.1 Approach Factors

For the Non-Western context, the ranked importance of the five tested *approach factors* are displayed in Fig 5.5.1 and Table 5.5.1. In this context, *Accessing the appropriate government official* is the most important reported factor influencing award of licence. This result confirms Salacuse's (2003) assertion (Section 3.3.3) that it is important to target the appropriate department and official within the government system. *Seniority of company representatives* (Kapoor et al, 2001; Marsh, 2001), an anticipated behavioural strength of Independents (Section 3.3.2), was also of relative importance. *Use of the same company representatives*, a further proposed behavioural strength of Independents (Section 3.3.2), was found to be the least important approach factor influencing award of licence in Non-Western countries (see Fig 5.5.1).

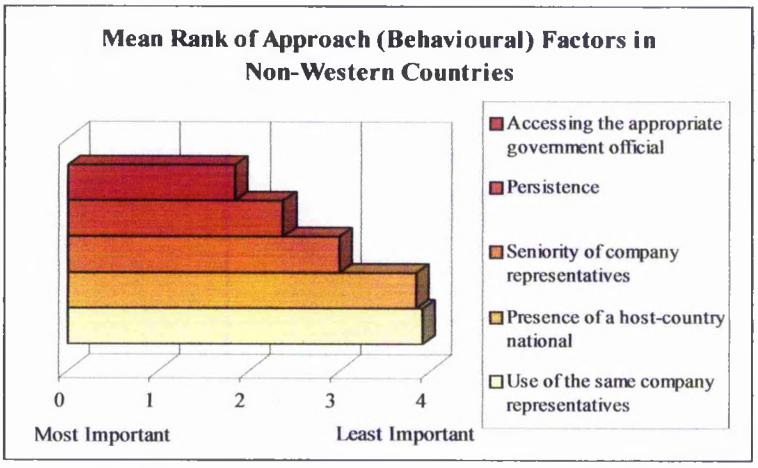


Fig 5.5.1

A Friedman test, χ^2 =17.05, (Prob. value = 0.002), shows it is unlikely the rankings for Fig 5.5.1 and Table 5.5.1 were derived by chance and that variables are therefore of differing preference. Results also display a high level of concordance in the rankings chosen by respondents, as indicated by Kendall's W= 0.328 (Prob. value = 0.002).

Approach Factors Influencing a Licence being Awarded in Non-Western Countries							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Accessing the appropriate government official	13	1.85	2	1	1.14	1	5
Persistence	13	2.38	2	Multiple modes exist	1.26	1	5
Seniority of company representatives	13	3.00	3	3	1.08	1	5
Presence of a host-country national among company representatives	13	3.85	4	Multiple modes exist	1.41	1	5
Use of the same company representatives	13	3.92	4	5	1.12	2	5

Table 5.5.1

For Western countries (Fig 5.5.2 and Table 5.5.2), *Persistence* is the most important factor influencing award of licence. In contrast to Non-Western countries (Fig 5.5.1), *Accessing the appropriate government official* is of negligible importance for the Western context. Such a result highlights the need for different *approaches* in each *context*. Whilst repeated licence applications are necessary for eventual success within Western countries, in Non-Western countries, access to the appropriate government official holds greater prominence. With different *approaches* required, it is likely that the two *contexts* deviate in their functioning. This finding accords with existing writings on government bureaucracy, where the West/Non-West distinction is recognised (Ye, 2003; Peters, 2001; Beetham, 1987).

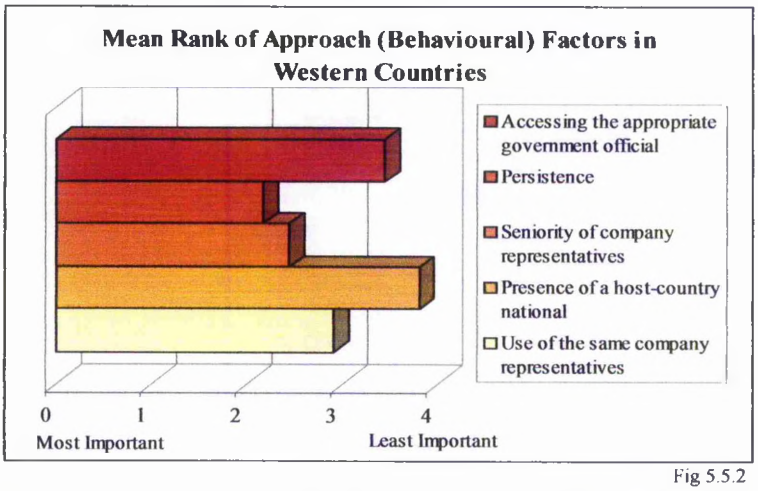


Fig 5.5.2

A Friedman test, $\chi^2 = 8.145$, (Prob. value = 0.086), shows differentiation between rankings in Table 5.5.2 to be weaker than for Non-Western countries. Results display a lower level of concordance in the rankings chosen by respondents; Kendall's W = 0.185 (Prob. value = 0.086).

Approach Factors Influencing a Licence being Awarded in Western Countries							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Persistence	11	2.18	2	Multiple modes exist	1.08	1	4
Seniority of company representatives	11	2.45	2	2	1.21	1	5
Use of the same company representatives	11	2.92	3	Multiple modes exist	1.40	1	5
Accessing the appropriate government official	11	3.45	4	5	1.70	1	5
Presence of a host-country national among company representatives	11	3.82	4	Multiple modes exist	1.33	1	5

Table 5.5.2

Combination of the British with the North American Independent results (Fig 5.5.3), confirms the original pattern in Fig 5.5.1; namely, *Accessing the appropriate government official* is the most important *approach factor* in Non-Western countries.

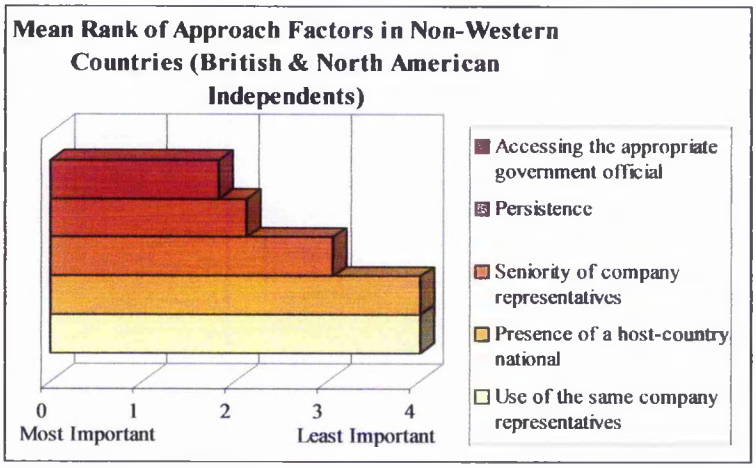


Fig 5.5.3

A Friedman test, $\chi^2 = 28.33$, (Prob. value = 0.000), shows it is unlikely the rankings for Fig 5.5.3. and Table 5.5.3 were derived by chance and that variables are therefore of differing preference. Results display a high level of concordance in the rankings chosen by respondents, Kendall's W= 0.417 (Prob. value = 0.000).

Approach Factors Influencing a Licence being Awarded in Non-Western Countries (British & North American Independents)							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Accessing the appropriate government official	17	1.82	2	2	1.02	1	5
Persistence	17	2.12	2	1	1.21	1	5
Seniority of company representatives	17	3.06	3	3	.97	1	5
Presence of a host-country national among company representatives	17	4.00	4	Multiple modes exist	1.28	1	5
Use of the same company representatives	17	4.00	4	5	1.06	2	5

Table 5.5.3

Combination of the British with the North American Independent results (Fig 5.5.4), strengthens the findings of Fig 5.5.2. That is, *Persistence* is the most significant factor, whilst *Accessing the appropriate government official* and *Presence of a host-country national* are the least important *approach* factors in Western countries.

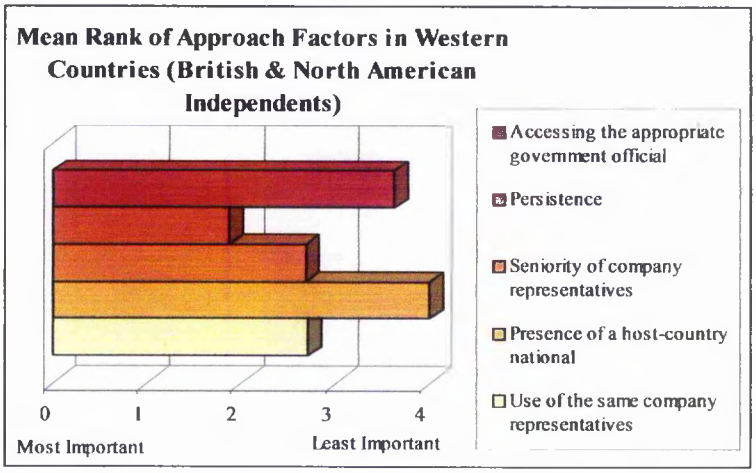


Fig 5.5.4

A Friedman test, $\chi^2 = 17.85$, (Prob. value = 0.001), shows it is unlikely the rankings for Table 5.5.4 and Fig 5.5.4 were derived by chance and that variables are therefore of differing preference. Results display a high level of concordance in the rankings chosen by respondents, Kendall's W= 0.279 (Prob. value = 0.001).

Approach Factors Influencing a Licence being Awarded in Western Countries (British & North American Independents)							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Persistence	16	1.88	1.50	1	1.03	1	4
Seniority of company representatives	16	2.69	2.5	2	1.30	1	5
Use of the same company representatives	16	2.71	2	2	1.21	1	5
Accessing the appropriate government official	16	3.63	4	4	1.46	1	5
Presence of a host-country national among company representatives	16	4.00	4	5	1.21	1	5

Table 5.5.4

5.5.2 Content Factors

Level of commitment to drill is the most important technical factor influencing award of licence in Non-Western countries (Fig 5.5.5). Thus, it is seen that governments seek assurance that drilling activity will occur. According to these results, Non-Western countries will make awards to those companies where the licence will be treated as supporting a 'core' committment, in the sense that a work programme will be undertaken, and investment made (Hannon, 2004). This is followed in importance by *Financial capability*. Non-Western Governments seek confirmation that firms have the *Finance* to undertake the planned activity.

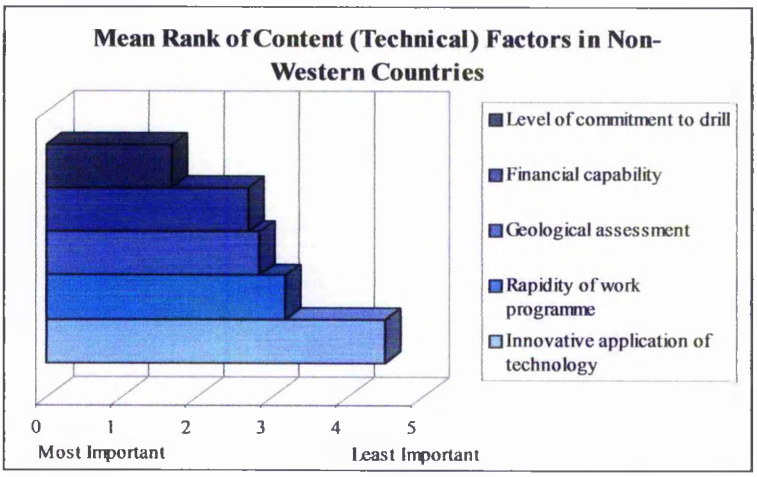


Fig 5.5.5

A Friedman test, $\chi^2 = 19.73$, (Prob. value = 0.001), shows it is unlikely the rankings for Fig 5.5.5 and Table 5.5.5 were derived by chance and that variables are of differing preference. Results display a high level of concordance in the rankings chosen by respondents, as indicated by Kendall's W= 0.411 (Prob. value = 0.001).

Content Factors Influencing a Licence being Awarded in Non-Western Countries							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Level of commitment to drill (e.g. 'Firm' or 'Contingent' well)	12	1.67	1	1	.89	1	3
Financial capability	12	2.69	3	Multiple modes exist	1.18	1	5
Geological assessment (e.g. new play idea, lead)	12	2.83	3.5	4	1.40	1	4
Rapidity of work programme	12	3.17	3	2	1.19	2	5
Innovative application or development of technology	12	4.50	5	5	1.00	2	5

Table 5.5.5

Similar to Non-Western countries, in Western countries *Level of commitment to drill* is the most important *content* factor influencing the award of licence (Fig 5.5.6). This is followed in importance by *Geological assessment*. Comparing ranks, *Geological assessment* is of greater influence in the Western (Fig 5.5.6) than the Non-Western (Fig 5.5.5) *context*. This suggests that more thorough technical analysis is required in Western countries.

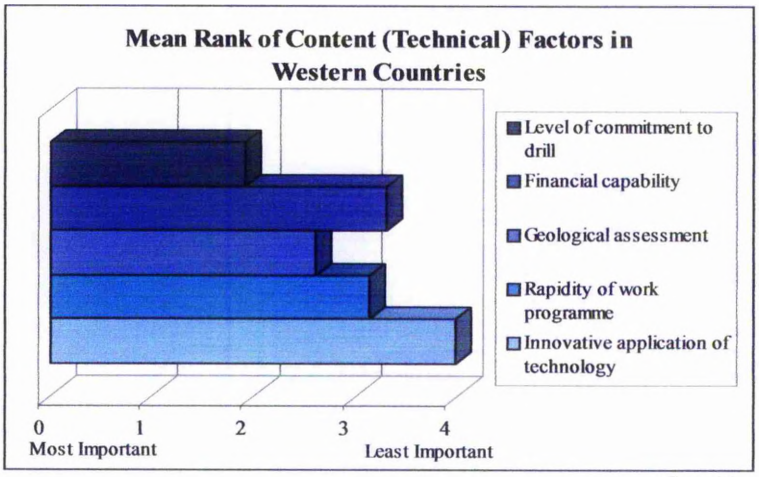


Fig 5.5.6

A Friedman test, $\chi^2 = 12.62$, (Prob. value = 0.013), shows it is unlikely the rankings for Table 5.5.6 and Fig 5.5.6 were derived by chance and that the variables are therefore of differing preference. Results display a high level of concordance in the rankings chosen by respondents, Kendall's W= 0.243 (Prob. value = 0.013).

Content Factors Influencing a Licence being Awarded in Western Countries							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Level of commitment to drill (e.g. 'Firm' or 'Contingent' well)	13	1.92	1	1	1.12	1	4
Geological assessment (e.g. new play idea, lead)	13	2.62	3	3	1.33	1	5
Rapidity of work programme	13	3.15	3	Multiple modes exist	1.07	2	5
Financial capability	13	3.31	3	5	1.60	1	5
Innovative application or development of technology	13	4.00	4	5	1.23	2	5

Table 5.5.6

5.5.3 Context Comparison

5.5.3.1 Importance of Approach & Content Factors in Western vs. Non-Western Contexts

Table 5.5.7 displays results for the intra-firm, cross-country comparisons asked in Question 3.3 of the Independent SSI (Appendix 1.2). For this question, interviewees were asked to compare the two countries (Western and Non-Western) in which they had applied for an exploration/production licence. As Table 5.5.7 demonstrates, for this comparison, *approach / behavioural* factors were found to have a greater influence upon the awarding of licences in Non-Western (8/10 = 80%), relative to Western countries (2/10 = 20%). In contrast, *content/technical* factors tend to be of greater influence upon the awarding of licences in Western (7/10 = 70%), relative to Non-Western countries (3/10 = 30%). The strength of this relationship is suggested by the fact that no companies (0/10 = 0%) have simultaneously detailed *content* factors to be of greatest influence in Non-Western countries, and *approach* factors to be of greatest influence in Western countries.

Relative Factor Influence in Non-Western vs. Western Countries			
		Content (Technical) Factors	
	Variable Box ordering - Count - % of Total	Of greatest influence in **Non-Western**	Of greatest influence in **Western**
Approach (Behavioural) Factors	Of greatest influence in **Non-Western**	3 30%	5 50%
	Of greatest influence in **Western**	0 0%	2 20%

Table 5.5.7

As discussed in Section 6.3.3, the above finding indicates that the Western *context* is one which more closely approximates to the functioning of Weber's (1947, p.301) 'ideal' bureaucracy than does the Non-Western *context*.

Further evidence, suggesting difference between the Western and Non-Western contexts, regards the formalization of the licensing agency's selection procedure as important (Question 3.4, Appendix 1.2). As shown in Table 5.5.8 and Fig 5.5.7, Western countries are primarily orientated towards a formally based system of selection, whilst among Non-Western countries relationship based approaches are more important. Similar to charts in Section 5.3.1, the length of the arrow in Fig 5.5.7 represents the magnitude of the orientation on the original Likert scale relative to the equidistant point.

Position on the spectrum between a Formal approach & a Relationship based approach of the Licensing Authority's Selection Procedure							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Western countries	14	3.29	3	2	1.94	1	6
Non-Western countries	13	4.77	6	6	2.13	1	7
Note: On spectrum 1 = Formally based, 7 = Relationship based, 4 = Equidistant point							

Table 5.5.8

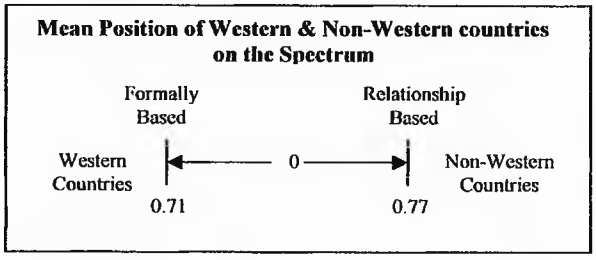


Fig 5.5.7

An independent samples t-test of the mean differences in formalization of the licensing authorities' selection procedures, between Western and Non-Western countries, supports the results shown in Table 5.5.8 and Fig 5.5.8 (t statistic = 1.896; Prob. value = 0.070).

Combining the North American responses with the British reinforces the above findings (See Table 5.5.9 and Fig 5.5.8). Western countries' selection procedures are of greater formal orientation, whilst Non-Western countries' selection procedures are more relationship based.

Position on the spectrum between a Formal approach & a Relationship based approach of the Licensing Authority's Selection Procedure - (North American & British Independents)							
Variable	*N*	*Mean*	*Median*	*Mode*	*Standard Deviation*	*Min*	*Max*
Western countries	24	2.67	2	1	1.81	1	6
Non-Western countries	19	4.79	6	6	2.02	1	7
Note: On spectrum 1 = Formally based, 7 = Relationship based, 4 = Equidistant point							

Table 5.5.9

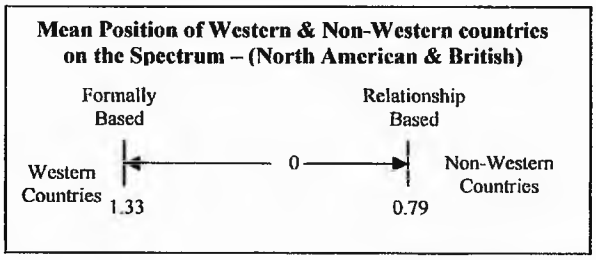


Fig 5.5.8

An independent samples t-test of the mean differences in formalization of the licensing authorities' selection procedures, between Western and Non-Western countries, confirms this result (t statistic = 3.632; Prob. value = 0.001).

5.5.3.2 Strengths / Weaknesses of Small Firm Size

The following Tables 5.5.10-14 categorise the answers given by interviewees to open ended Question 3.5 (Appendix 1.2). Table 5.5.10 summarises the reported strengths that smaller firm size confers when applying for exploration licences in Western countries. For this *context*, most respondents (8/14 = 57%) stated smaller firm size conferred no advantage. The only significant reported strength, was *speed of decision-making and action* (6/14 = 43%). Next in importance was *focus*, the degree of commitment to a particular asset (3/14 = 21%).

Following a similar structure to the previous table, Table 5.5.11 displays the main weaknesses that smaller firm size confers when applying for exploration licences in Western countries. The principle weakness recorded by the majority of Independents (12/14 = 86%) was *financial capability*. Western governments were reported to be particularly focused upon whether firms of Independent size could sufficiently finance exploratory, and especially the follow-on, development activity. As previously noted for

What **advantages** does smaller firm size confer when applying for an exploration licence in **Western** countries?

Independent	*None*	*Speed (Approach & Content)*	*Focus (Content)*	*Technology (Content)*	*Materiality (Interest)*	*New Geological Ideas (Content)*	*Scale Dependent*	*Niche (Content)*	*Non-threatening (Content)*
A	None								
B	'Virtually None'					'If new ideas have an advantage' Although, this holds for 'small & large' companies.			
C		'speed of decision-making'							
D						'If a novel technical idea is held, then chance of getting [a licence] relative to a Major can be enhanced'			
E			'Ability to demonstrate a greater degree of commitment than a larger company may have time for'	'Technology is not a divider now; 10 years ago yes, but not now.'					
F		'Get-on, move faster'	'Smaller portfolio, new acreage more important to them'		'Interested in smaller prospects that larger would by-pass'				
G	'No Government that actively wants small companies'							'Only if there is a niche'. A specialized knowledge base.	

Table 5.5.10

What **advantages** does smaller firm size confer when applying for an exploration licence in **Western** countries?

Independent	*None*	*Speed (Approach & Content)*	*Focus (Content)*	*Technology (Content)*	*Materiality (Interest)*	*New Geological Ideas (Content)*	*Scale Dependent*	*Niche (Content)*	*Non-threatening (Content)*
H		'moving quickly'							
I	'No Advantage'	Speed of development	Focus	'Now smaller companies…equally the same access to technology'					
J	None								
K	None						DTI - Larger Independents preferred		
L	None				'Can go for smaller discoveries, say 50m barrels' as not on the Majors' 'radar screen'				
M		'Speed of negotiating licence & speed of development'							
N	'They need the government more than the government needs them'	'Quicker decision making'							'Non-threatening - more honest, more open genuine relationship with others'

Table 5.5.10

What **disadvantages** may smaller firm size confer when applying for an exploration licence in **Western** countries?

Independent	*Financial Capability (Content)*	*In-house capabilities (Content)*	*Experience (Content)*	*Reliance upon Contractors (Content)*	*Scale Dependent (Content)*	*Credibility (Content)*	*Safety Procedure (Content)*	*Provision for Liabilities (Content)*
A	'Finance…don't have money'							
B	'Financial capability'			The fear might be that our limited funds prevent us from 'employing higher quality contractors', but the reality is, by law all contractors must be of a certain standard – 'all need to be qualified anyway' before they are permitted to operate.		'Health & Safety…risk to civil servant granting licence…used to be a problem, a small company might skimp on something, & resulting risk to civil servant might be bad for their career prospects, thus tougher on new entrants.'		
C	'Competing against companies with larger pockets' 'Bank bonds to work commitments, act as a terrible millstone.'		Larger companies may have 'a better track record'		Larger companies may be 'willing to invest more.'			
D	'First is Financial'	'Second is technical…won't let a small company in deepwater as don't think they will develop it.'						
E	'Perception of financial risk…may call into question ability to finance.'							
F	'Financial capability for appraisal & development, caused by delays to raise finance.'							
G	'lack of money, financial capability'							

Table 5.5.11

What **disadvantages** may smaller firm size confer when applying for an exploration licence in **Western** countries?

Independent	*Financial Capability (Content)*	*In-house capabilities (Content)*	*Experience (Content)*	*Reliance upon Contractors (Content)*	*Scale Dependent (Content)*	*Credibility (Content)*	*Safety Procedure (Content)*	*Provision for Liabilities (Content)*
H	'Perception by host government that the company may not have the financial or technical wherewithal to pursue licence.'	In-house capability	'for offshore, yes'	Reliance upon contractors				
I	'perceived financial capability'	'UK [licensing body] doesn't like virtual oil companies, need a certain extent [of skills to be] internal'		'Not a problem today, but if activity in the North Sea falls off, many of the service providers (platforms/rigs) will leave & availability of kit & equipment may be an issue.'				
J	'financial capability'							
K					DTI – Larger Independents preferred			
L			In Western mature basins, we have a 'lack of detailed regional knowledge…data base etc' that a Major would have.					
M	'host governments see financial capability of the larger firms as more attractive'							
N	'Financial capability'	'Resource constraint'	'Perception probably true, company has a smaller, shorter record of proof of ability'					

Table 5.5.11

the context of the UK DTI, checks must be made to ensure a firm can afford to complete the work programme it is offering (DTI, 2003) (Section 3.3.1). Of lesser significance than finance, was *in-house capability* (4/14 = 29%) and experience (4/14 = 29%). Independents were reported not to have the breadth of in-house capability or long-term "proof of ability" that larger firms usually possessed.

For the Non-Western *context*, Table 5.5.12 presents the strengths that smaller firm size may confer when applying for exploration licences. Dissimilar to the Western results, all Independents recognised smaller size to confer some advantages in the Non-Western *context*. The two most common strengths were the *approach* factors, *seniority of representatives* (5/14 = 36%) and *communication* (5/14 = 36%). Apart from the emphasis upon the decision-making authority and the ability to commit, enabled by *senior representatives*, reference was also made to the Independents' "personal approach", the "personal interaction between senior staff and [the] licensing authority" (Independent I) and their ability to deal with "softer issues" (Independent K). This evidence is further enhanced by the answers given for *communication*, where an emphasis upon "creating...relationships" is detailed by all the respondents (Independents C, E, H, I, M). As reviewed in Section 6.3.4 establishing relationships can be a powerful tool in achieving negotiating gain (Halpern, 1994; Greenhalgh and Chapman, 1998). A further strength supplied by respondents was that Independents are a *lesser threat* to the host authorities; they are "more flexible" (Independent J), "looking to do business rather than set direction" (Independent N) and succeed in states where working by the "rulebook...wouldn't work" (Independent G). Several Independents acknowledged themselves to be flexible in structuring deals with Non-Western authorities. For example, Independents E & G, recognised that when applying for a licence in Post-Soviet State X, it was their willingness to guarantee utilisation of the State's contracting firms, that enabled a licence to be secured. In contrast, certain Majors were reported to have avoided the same Post-Soviet State, because of their unwillingness to accept such terms. A publicised example might be the withdrawal of Shell and ChevronTexaco from Bangladesh. The government of Bangladesh is unwilling to permit gas exports until 'sizeable' reserves have been discovered. This 'intransigence' is noted by investment

What **advantages** may smaller firm size confer when applying for an exploration licence in **Non-Western** countries?

Independent	*Flexible Terms & Less-Coercive (Content)*	*Seniority of Company Representatives (Approach)*	*Communication Facilitated (Approach)*	*Risk (Interest)*	*Speed (Approach)*	*Materiality (Interest)*	*Increased Partnership Opportunity (Content)*	*New Geological Ideas (Content)*	*Focus (Content)*
A		'Can send senior people & can be there to make decisions.'		Our firm is 'below radar screen [of insurgents / extortionists etc] less kidnapping or extortion' likely to be experienced.					
B	'Colombia & Peru prefer smaller companies... most South American countries would rather not have Majors.' 'Feeling of insecurity also against American firms... nationality matters a lot.'							'More innovation & more ideas' holds for Western & Non-Western.	
C			'Can develop relationships at the top more quickly'		'Short decision chain, decide faster.'				
D						Taking Colombia as an example, there are 'very few large companies operating out there, the problem is the reserve size is below the level most Majors would look at.'			
E			'Executive Board members creating relationships at a very high level within governments & national oil companies.'						'Being able to demonstrate commitment' to a greater extent 'than a larger company would with its larger portfolio'
G	'Large companies do work by the rulebook & this wouldn't work' In Country X [Post-Soviet state] 'some officials don't want to be involved with a large company as fear bullying... Shell tried for years to get involved in the infrastructure of Country X, but never got in because the old guard didn't want to lose authority.'	'Reputation of the people... perception in the Soviet Union, [they] don't like to work with people below them.'				'Only if there is a particular niche, can go for projects that don't meet materiality requirements of the Majors'			

Table 5.5.12

What **advantages** may smaller firm size confer when applying for an exploration licence in **Non-Western** countries?

Independent	*Flexible Terms & Less-Coercive (Content)*	*Seniority of Company Representatives (Approach)*	*Communication Facilitated (Approach)*	*Risk (Interest)*	*Speed (Approach)*	*Materiality (Interest)*	*Increased Partnership Opportunity (Content)*	*New Geological Ideas (Content)*	*Focus (Content)*
H		'Send out very senior people all the time... willing to move quicker'	'Relationships more important'	'Willingness to take early political or geopolitical risk'	Senior people sent out are 'willing to move quicker'				
I		'Personal approach, personal interaction between senior staff & licensing authority.'	'Look you in eye can build a relationship... being able to talk to right people, access the right person.'						
J	'more flexible for host country'						'Possibility'		
K	'lesser-threat'	'Able to devote more senior management time to softer issues in dealing with government.' 'Seniority of management gives advantage.'							
L				'Less risk averse than some Majors may be... many high risk opportunities have been left unexplored.' We are 'happy to take risk that large may not.'	'Move quickly, get in & sniff out'		Partnership Opportunity		
M			'Larger firms use diplomatic approach i.e. UK government support [representation].' However, this is 'like putting an agent in the way, we prefer face to face ourselves, without other influencing parties.'			'Thresholds of interest may be lower. Larger companies will ship over the smaller prospects.'			
N	'Non-threatening, looking to do business rather than set direction.' 'More adaptable & flexible'				'Quicker decision-making'				

Table 5.5.12

analysts to 'have taken its toll on both Shell and ChevronTexaco': leading to their exit from the country (Rose and Wilders, 2003, p.9). In contrast, despite such circumstances, both Tullow and Cairn resolutely continue to hold interests in Bangladesh.

Beyond the above referenced negotiating *approach* and deal *content* strengths, some Independents' (3/14 = 21%) willingness to operate in countries with political risk was noted as increasing the chances of licence award, since few other companies held equivalent 'interest'. This result is further examined in Section 5.6.6 and discussed in Section 6.4.7, where it is shown that several Independents have an affinity towards such politically ambivalent states.

Similar to the Western *context*, the greatest disadvantage that smaller firm size confers when applying for exploration licences in Non-Western countries was *financial capability* (7/14 = 50%) (Table 5.5.13). In addition, for Non-Western countries, several interviewees reported (7/14 = 50%) that the authorities' doubts were focused upon the overall ability to deliver; i.e. on whether an Independent of such a small size had the capability to do the job. A further Independent weakness was *resource transfer* (3/14 = 21%). Whilst Major companies would train and hire local staff, this training capability was not so widely practiced by Independents. Independents would usually hire local staff with existing experience.

Nevertheless, in spite of these *content* weaknesses, as Section 6.3.4 discusses, it is the Independents' strength in *approach* factors that may explain their propensity to engage in Non-Western countries (Section 5.6.3).

What **disadvantages** may smaller firm size confer when applying for an exploration licence in **Non-Western** countries?

Independent	*Financial Capability (Content)*	*Ability to Deliver (Content)*	*Resource Transfer / Amount Spent (Content)*	*Prestige (Approach)*	*Quality of Work (Content)*	*Geoscience Capability (Content)*	*Partnership (Content)*	*Connections (Approach)*
A					Must demonstrate that you will be using the 'best consultants', therefore 'bring the consultants to show them'.			
B	'Fulfilment of programme… need financial guarantee'	'Comes down to resources…expensive data purchase packages, requirement for local partner etc.'						
C		'Not sure you have the ability to do the work you promise to do…safety etc.'			With Exxon know the 'proper way' will be followed, whereas will be 'suspicious if small company is cutting corners…we do cut corners, don't gold plate.'			
D			'Technology transfer, can't brag about.'					
E		'Lack of reputation & recognition that Supermajors enjoy due to lack of size.'						
G	'Financial capability'							

Table 5.5.13

What **disadvantages** may smaller firm size confer when applying for an exploration licence in **Non-Western** countries?

Independent	*Financial Capability (Content)*	*Ability to Deliver (Content)*	*Resource Transfer / Amount Spent (Content)*	*Prestige (Approach)*	*Quality of Work (Content)*	*Geoscience Capability (Content)*	*Partnership (Content)*	*Connections (Approach)*
H	'Financial capability'	'Reputation could be an issue'					'Possible requirement to secure partners, time taken to find partners.'	
I	'Financial ability'		'We can't bring a transfer of technology overseas…take on locals & train, can't offer that…[rather] hire local staff with experience. Don't train, but BP & Shell will.'	Limited prestige 'can be an element'				
J	'Financial capability'	'Ability to deliver'				'Geoscience capability in analysis…to interpret very large areas.'		
L				'The status of a large company means that the country gets noticed'. Whereas a 'small company has to work harder to show its credentials.'				'A large company may have had people out there…history of connections' may be stronger.
M			'Like to see larger companies, as they spend more.'					
N	'Financial capability'	'Resource constraint' 'Perception probably true, company has a smaller, shorter record of proof of ability.'						

Table 5.5.13

5.6 INTERNATIONAL STRATEGY

5.6.1 Why Internationalise?

Independents were classified as *international* if they held licences in two or more countries. Since most of the British Independents were *born foreign* (Section 5.6.5), Independents were asked (Question 4.2, Appendix 1.2) what the rationale was for their move into a second country. Table 5.6.1 categorises the primary rationales given by Independents for this first international move.

Primary Rationale to First Expansion Overseas[1]	
Rationale	*No. of Firms*
Greater potential of oil/gas areas abroad	4
Diversify portfolio	1
Knowledge of forthcoming asset sale	1
Proximity to market	1
Company's oil reserves expansion	1
Greater possibility of control (Operator)	1
Government bureaucracy less arduous	1

Table 5.6.1

Assessment of why Independents first chose to expand abroad reveals that the most important variable is the potential of under-explored foreign oil and gas areas (Table 6.6.1). Closer inspection made in Section 6.4.1 reveals this finding to concord with O'Connor's (2000) emphasis on the growing importance of 'non-traditional petroleum countries'. Beyond the primary rationale given by respondents (Table 5.6.1), the most frequently referenced supporting rationale (60% of Independents) was geographical diversification (Fig 5.6.1). As discussed in Section 6.4.1, the prominence of portfolio diversification, as a rationale to overseas expansion, can be explained by Markowitz (1970).

[1] The results do not include Independents J or L because interviewees were not present at the company's first internationalising move.

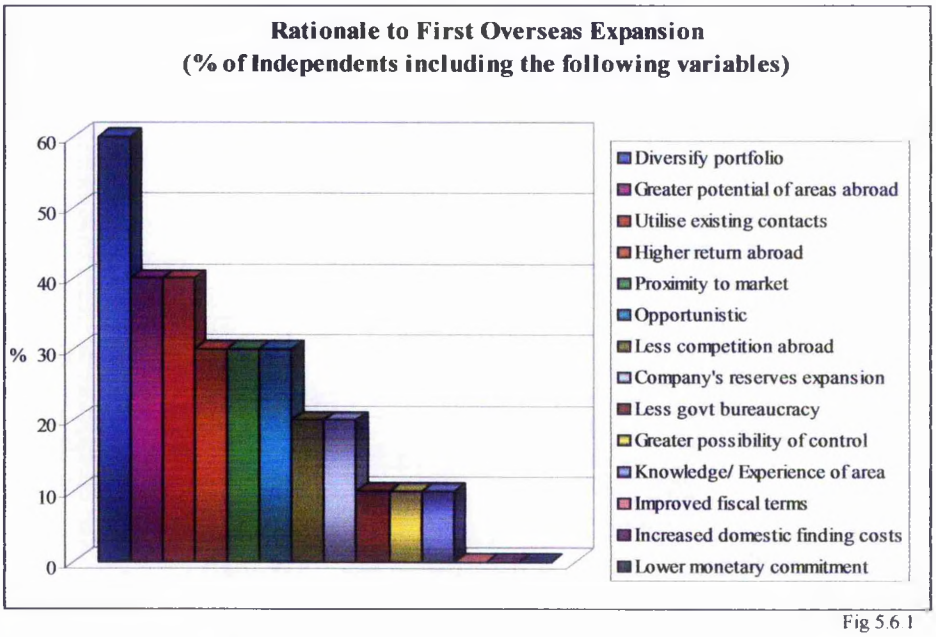


Fig 5.6.1

With the exception of Independents D & F, all the Independents interviewed currently seek to increase their international operations. The most important rationale supporting this intention was the desire to expand the company's oil/gas reserves (Table 5.6.2). Independents thus appear attuned to investor's focus upon reserves growth (Bauquis, 2000; Antill and Arnott, 2000; Rose and Wilders, 2003). As Figure 5.6.2 demonstrates, reserves expansion was also the most frequently referenced supporting rationale (80% of Independents) for an Independent seeking to increase its international operations.

Primary Rationale for Further Seeking to Increase International Operation	
Rationale	*No. of Firms*
Company's oil/gas reserves expansion	5
Greater potential of oil/gas areas abroad	4
Diversify portfolio	1
Utilise existing contacts	1
Higher return abroad	1

Table 5.6.2

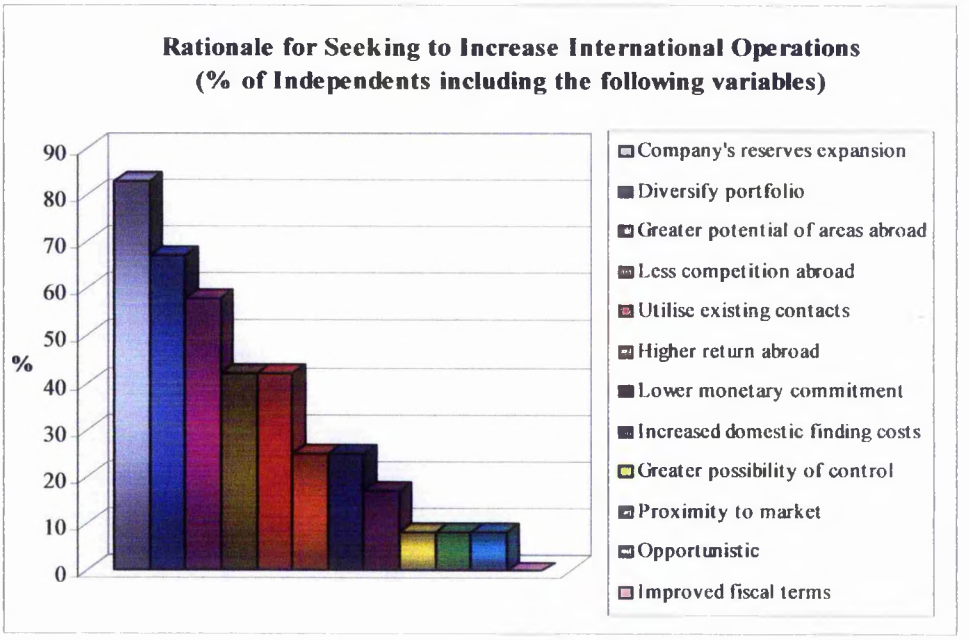


Fig 5.6.2

For the 58% (7/12) of North American Independents that seek to increase their international operations, the most frequently expressed rationale (7/7) is the company's oil reserves expansion (Fig 5.6.3). This is followed by the unexplored potential of oil/gas areas abroad (6/7) and the need to diversify the portfolio (5/7). These results are similar to those of the British cases and thus add further evidence to support the view that the above three rationales act as principal stimuli for the Independents' further internationalisation.

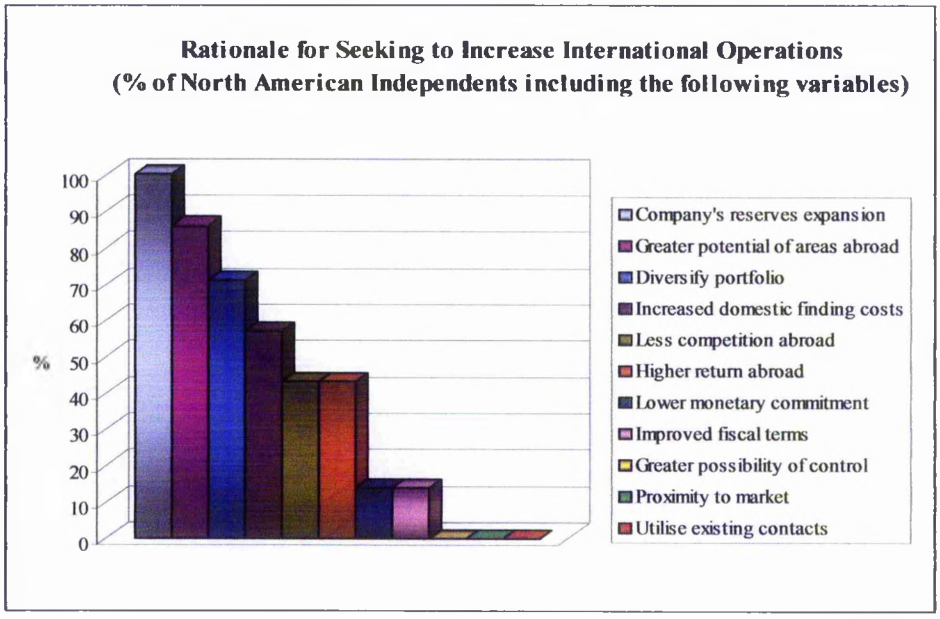


Fig 5.6.3

5.6.2 Mode of Entry

In contrast to the predictions of the Uppsala model (Section 3.4.4), the majority of firms were found to have undertaken their first expansion overseas by playing the resource intensive role of Operator (Fig 5.6.4).

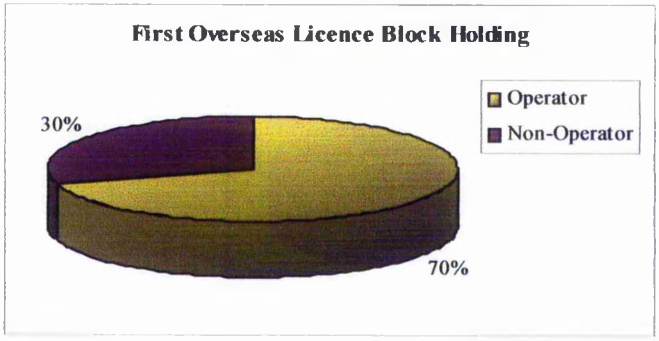


Fig 5.6.4

The predominant reason for this mode of entry was that the Independents wished a greater degree of control over their operations (Table 5.6.3); firms preferred to be in-charge. As it was expressed by Firm B, it is: "...hard to add value as Non-Operator, invested in someone else's ability." Sometimes this decision was partially born out of

necessity rather than choice; Firm A acknowledged that the reason for being an Operator was because they were one of the first firms to enter the region. Another, Firm E, recognised that a particular country's low cost of entry was a factor in permitting the position of Operator to be undertaken. In accordance with the Uppsala model, the role of Non-Operator was chosen by some Independents (H and K) because they wished to limit their initial commitment, but these firms were in the minority.

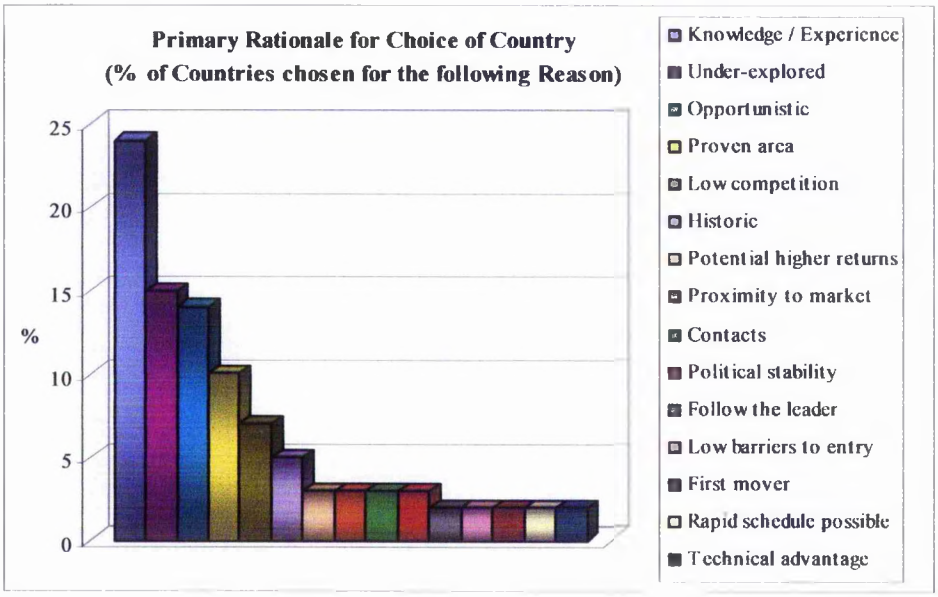
Reason for Choice (Operator vs. Non-Operator) [2]			
Independent	*Country*	*Operator / Non-Operator*	*Reason*
A	Non-Western	Operator	First Mover
B	Non-Western	Operator	Control
E	Western	Operator	Low Cost of Entry
H	Western	Non-Operator	Large Size of Project
I	Western	Operator	Control
K	Western	Non-Operator	Risk Management
M	Non-Western	Operator	Control

Table 5.6.3

5.6.3 Choice of Country

As the Uppsala model (Section 3.4.3) would hold, the most frequently referenced primary rationale (24% of countries) for choosing a particular country, was found to be existing firm knowledge / experience (See Fig 5.6.5). Inclusion within this category meant the firm's response fitted one, or all, of the following three aspects. Firstly, that the firm's managers had knowledge/experience of working in the country before. Secondly, that the geology was similar or was a spatially proximate extension of the geological basin with which the firm was familiar. And thirdly, that the specialist techniques required for the licence were similar to that implemented by the firm elsewhere. For example, if the firm was a specialist in mature fields, then experience/knowledge of work-over procedures would be transferable. For a quarter of the countries in which the Independent sample held licences, knowledge/experience was the primary rationale for choice of country.

[2] A low response rate is due to interviewees of Independents C, D, G, J, L & N not having been present at company's birth.



[3]

Fig 5.6.5

The next primary reason for country choice was that areas within certain countries had been under-explored (15% of countries) (Fig 5.6.5). Respondents identified particular areas as not having received sufficient attention to date, and as being highly prospective. Finally, the next most important reason for country choice was opportunism (14% of countries). There had been no set intention of entering the particular country, rather a suitable 'deal' had presented itself and the firm had seized it (in corporate strategy terms, a target or window of opportunity).

Cross tabulation of the current countries within which the Independent population holds licences, reveals a propensity for Independents to be Operators in Non-Western countries, and Non-Operators in Western countries (Table 5.6.4). A Pearson χ^2 value of 3.914 (Prob. value = 0.048) confirms the cross-tabulated distribution not to be a product of chance. Although the cause of this orientation is not clear, it may be that it is Independents' strength in negotiating approach factors which enhances their ability to gain Operator status in Non-Western countries (Section 6.3.4).

[3] 'Historic' includes those countries that were remnants of other firms' interests. Thus current ownership by the Independent was not intended, but rather originated with the take-over.

Distribution of the Independent Population's Current Interests (Count = No. of Countries)[4]			
		Operator	*Non-Operator*
Western	Actual Count	9	20
	Expected Count	12.9	16.1
	Actual % of Total	14.3%	31.7%
Non-Western	Actual Count	19	15
	Expected Count	15.1	18.9
	Actual % of Total	30.2%	23.8%

Table 5.6.4

5.6.4 Born Foreign?

Compilation of the available information sources reveals the majority of Independents to have commenced their first licence holding outside the UKCS. These initial interests were not simultaneously accompanied by other foreign interests. Instead, firms were found to start with just one country of activity (Table 5.6.5). The evidence suggests most firms were born foreign, not international. Firms that first commenced with operations in the UKCS, are recognised to be in the minority. Nevertheless, most firms do have their headquarters located within the UK; the exceptions being Dragon Oil, Global Energy, Sibir, and Soco International.

Location of Birth	
Independent	*Country of first licence holding*
Pan Andean	Bolivia
Northern	Italy
Desire	Falklands
Emerald	Colombia
Regal	Ukraine
Edinburgh	UK
JKX	Ukraine
Ramco	Azerbaijan
Venture	Trinidad
Dana	Russia
Sibir	UK
Premier	UK
Tullow	Senegal
Source: Historic Annual Reports, Newspaper Archives & Company Interviews.	

Table 5.6.5

[4] The table excludes those countries in which a firm was both Operator and Non-Operator.

As Table 5.6.6 shows, British Independents, of both small and large size, hold a similar disposition towards international activity. An independent samples t-test of the mean differences between the number of countries in which small and large Independents are active was insignificant (t-statistic = -1.795; Prob. value = 0.102).

Number of Countries in which Small and Large Independents are Active			
Size of Firm	*N*	*Mean*	*Standard deviation*
Small (Market Capitalization < £100m)	12	2.83	1.47
Large (Market Capitalization > £100m)	9	5.00	3.39

Table 5.6.6

In contrast, size of firm strongly affects the international orientation of North American Independents. As Table 5.6.7 shows, North American Independents, with a firm size beneath £1000m market capitalization, tend only to have activities in North America. It is only those very large North American Independents, with a market capitalization exceeding £1000m, where international activity predominates. A Pearson χ^2 value 14.734 (Prob. value = 0.000), confirms the cross-tabulated distribution in Table 5.6.7 not to be a product of chance. British Independents have a greater propensity to engage in international activities than North American Independents of equivalent size (i.e. market capitalizations beneath £1000m).

International Activity of North American Independents Relative to Firm Size			
		Firm Size (Market Capitalization)	
		< £1000m	*> £1000m*
North America Only (US + Canada)	Actual Count	25	6
	Expected Count	18	13
	Actual % of Total	45.5%	10.9%
International	Actual Count	7	17
	Expected Count	14	10
	Actual % of Total	12.7%	30.9%

Table 5.6.7

5.6.5 Business Model

For the Independent population, five differing business models may be distinguished. These include the: *Country Focused*, *Mature Asset Specialists*, *Regionally Focused Internationally Diversified*, and *Portfolio Approach*. Models are differentiated both by their level of geographic diversification, and their tendency to Operate.

*Country focus*ed Independents tend to have activities in only one country (see Table 5.6.8). Firm types range in size from the small Desire Petroleum to the large Sibir. Within this category, firms appear to utilise country specialisation as their source of

⊙Country Focused⊙								
Independent	*Market cap' (£m)*	Country of Focus	*No. of Countries where interests held*	*No. of Countries where Operator*	*% of Total Licences that are Non-Operated*	*Undertaken Field Development as Operator*	*Licence Operator Offshore*	*Licence Operator Onshore*
Desire	14.37	Falklands	1	1	20	-	Yes	No
Emerald	22.36	Colombia	1	1	0	Yes	No	Yes
Regal	48.54	Ukraine	2	2	0	No	No	Yes
Edinburgh	53.25	UKCS	1	1	69	Yes	No	Yes
Dragon	124.94	Turkmenistan	1	1	-	-	Yes	No
Sibir	259.44	Russia	1	1	-	-	No	Yes

Table 5.6.8

advantage. For example, Independent F, a constituent of this category, expressed their reason for not internationalising as being because they "wished to retain focus" and "exploit the goodwill" and "track record" they had developed in Country Y. Retaining a focus on Country Y, meant they could "play to strengths". As discussed in Section 6.4.2 such firms seem to accord with Hymer's (1976) 'liability of foreignness' thesis.

Similar to *Country Focused* models, *Mature Asset Specialists* also exhibit a very low degree of international licence dispersion (Table 5.6.9). They Operate a large number of

Mature Asset Specialists							
Independent	*Market cap' (£m)*	*No. of Countries where interests held*	*No. of Countries where Operator*	*% of Total Licences that are Non-Operated*	*Undertaken Field Development as Operator*	*Licence Operator Offshore*	*LicenceOperator Onshore*
Venture	132.0	2	2	37	Yes	Yes	Yes

Table 5 6 9

licences (12 for Venture Production, 'Venture' hereafter) and hold relatively few as Non-Operator. Emphasis is upon acquiring and re-invigorating existing wells to boost production through techniques such as: workover, infill drilling, or injection technology. Involvement in exploration drilling is less common, although still present. Geographical focus is predominantly upon the UKCS. Firms like Venture are dependent upon mature asset transfers, therefore proximity to the seller is likely to be important if deals are to be detected. Moreover, through specialising on the UKCS basin, Venture has developed a

thorough knowledge of this area that may assist in valuing deals. Another Independent openly acknowledged that one reason for seeking the role of Operator overseas, was because it was unable to compete with the knowledge/experience of the UKCS held by firms like Venture. For the mature asset firm, geographical dispersion is likely to be minimised in favour of the benefits conferred through focusing upon the area where mature asset transfers are most likely. Thus, it would not be paradoxical to say, as an interviewee from Venture did, that "concentration of assets brings synergies".

Regionally Focused firms are those that exhibit a moderate level of international licence dispersion (Table 5.6.10). Licences are held for a few countries within a regional basin of similar geology.

⊕Regionally Focused⊙								
Independent	*Market cap' (£m)*	*Countries of Focus*	*No. of Countries where interests held*	*No. of Countries where Operator*	*% of Total Licences that are Non-Operated*	*Undertaken Field Development as Operator*	*Licence Operator Offshore*	*Licence Operator Onshore*
Cairn	583.75	India & Bangladesh	3	1	63	Yes	Yes	Yes
Global	12.73	Panama, Colombia & Peru	3	-	-	-	-	-

Table 5.6.10

Although undertaking the role of Operator is integral to this group, a portfolio of Non-Operated assets is also held for the region. For Cairn Energy the position of regional geographic focus was different from the way the company functioned five years ago. Analysis of old annual reports reveals the firm to have adopted a similar international orientation to that of *Diversified* Premier Oil and Tullow (Cairn Energy, 1998). Cairn's original move to Bangladesh and later India, was reported to be a consequence of an initial deal opportunity that, following successful exploration, stimulated a complete firm re-orientation towards the region (Cairn Energy, 2002). With Cairn's current moves suggesting licence interests in Nepal (Cairn Energy, 2003), accordance with the *Regionally Focused* international strategy continues to influence firm direction.

Internationally Diversified Independents are those whose licences are highly geographically dispersed (Table 5.6.11-13). For these Independents, the larger the firm

⊙Diversified Firms of Small Size⊙							
Independent	*Market cap' (£m)*	*No. of Countries where interests held*	*No. of Countries where Operator*	*% of Total Licences that are Non-Operated*	*Undertaken Field Development as Operator*	*Licence Operator Offshore*	*Licence Operator Onshore*
Pan Andean	10.41	2	0[5]	100	No	No	No
Northern	10.42	4	4	17	No	Yes	Yes

Table 5.6.11

⊛Diversified Firms of Medium Size⊛							
Independent	*Market cap' (£m)*	*No. of Countries where interests held*	*No. of Countries where Operator*	*% of Total Licences that are Non-Operated*	*Undertaken Field Development as Operator*	*Licence Operator Offshore*	*Licence Operator Onshore*
Aminex	19.90	3	2	-	Yes	Yes	Yes
JKX	57.81	4	1	56	Yes	No	Yes
Melrose	81.68	3	2	30	-	Yes	Yes
Ramco	99.87	5	2	47	Yes	Yes	Yes
Soco	216.60	6	3	29	-	Yes	Yes

Table 5.6.12

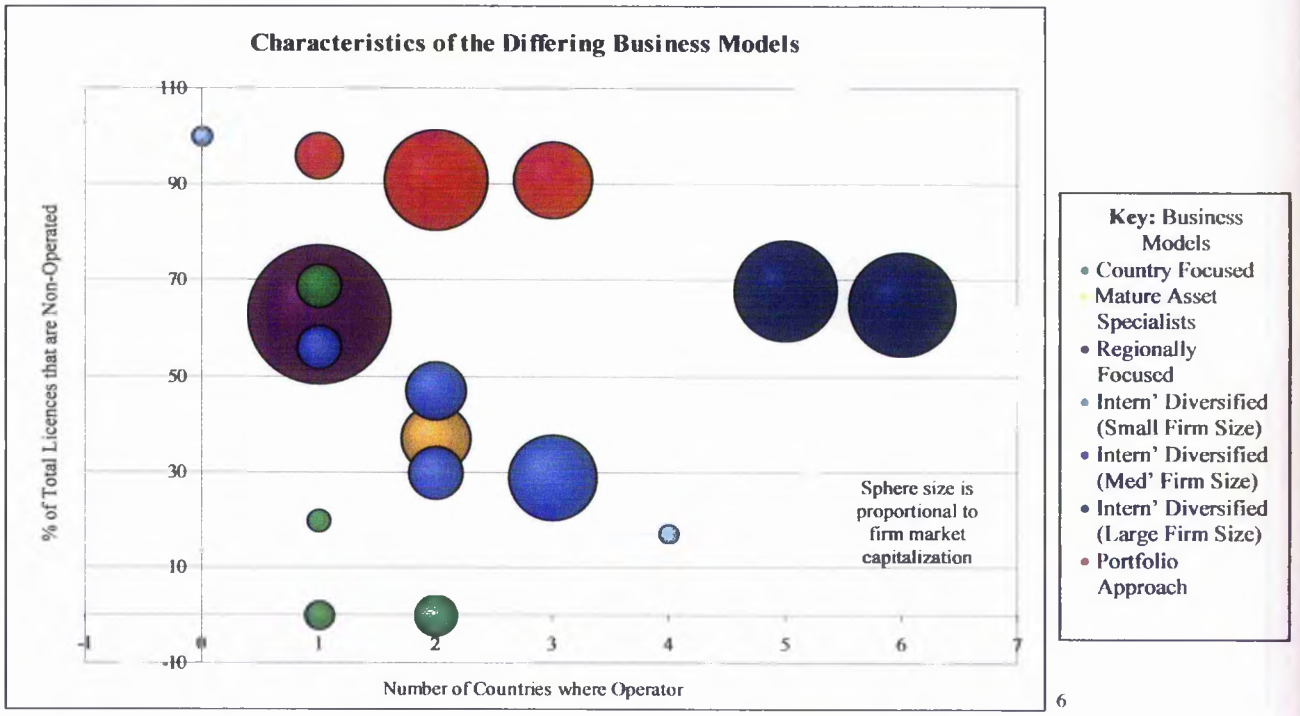
•Diversified Firms of Large Size•							
Independent	*Market cap' (£m)*	*No. of Countries where interests held*	*No. of Countries where Operator*	*% of Total Licences that are Non-Operated*	*Undertaken Field Development as Operator*	*Licence Operator Offshore*	*Licence Operator Onshore*
Premier	295.61	8	5	68	Yes	Yes	Yes
Tullow	319.58	9	6	65	Yes	Yes	Yes

Table 5.6.13

size, indicated by the darker shades of blue in Fig 5.6.6, the more geographically diversified the firm. Among the companies in this model, Operated licences are sought in geographically diverse locations. For example, Premier Oil Operates licences in Guinea Bissau, India, Myanmar, and Pakistan, whilst Soco International Operates licences in Vietnam, Mongolia and Thailand. An international Non-Operated portfolio is present among these firms, although its relative significance is much lower than for the following *Portfolio Approach* model.

[5] Pan Andean's business model was to Operate licences, but at the time of the 2002 Annual Report it had just sold its Operated holdings.

Fig 5.6.6 displays a series of spheres each of which represents attributes of an Independent. The spheres are coloured according to the particular business model. Along the x-axis is the number of countries in which an Independent holds licences as Operator, whilst the y-axis displays the proportion of total licences held as Non-Operator.



[6]

Fig 5.6.6

Portfolio Approach firms exhibit a very low degree of Operator dispersion; they are found to Operate in very few countries (Fig 5.6.6 and Table 5.6.14). However, their level of Non-Operated geographical licence dispersion is particularly high; thus more than 90% of each of the firms' total licences are Non-Operated (Fig 5.6.6). As discussed in Section 6.4.6, the substantial portfolio of licences held by the above firms would appear to follow diversification recommendations (Markowitz, 1970; Vickers, 1987; Brealey and Myers, 1996).

[6] The graph does not include Dragon Oil, Sibir, Aminex, or the Global Energy Development Corporation

©Portfolio Approach©							
Independent	*Market cap' (£m)*	*No. of Countries where interests held*	*No. of Countries where Operator*	*% of Total Licences that are Non-Operated*	*Undertaken Field Development as Operator*	*Licence Operator Offshore*	*Licence Operator Onshore*
Sterling	60.18	5	1	96	-	Yes	No
Dana	168.3	10	3	91	No	Yes	No
Paladin	295.4	6	2	91	No	Yes	No

Table 5.6.14

5.6.6 "Basket-case Countries"

Each country for which British Independents hold licences, Table 5.6.15 displays both Transparency International's Corruption Perceptions Index (CPI) 2003 score and the International Monetary Fund's Political Stability 2001 Index score. For the CPI index, countries are rated between 0 (highly corrupt) to 10 (highly clean). Similarly, for the Annett (2001) International Monetary Fund Political Stability index, countries are rated between -3 (highly unstable) to +3 (highly stable). The column entitled 'Average Corruption' provides the average corruption score for all the countries in which a company holds interests. Likewise, the column entitled 'Average Stability' gives the average political stability score for all the countries in which a company holds interests. Companies are listed in combined rank order: those with the highest corruption and political instability scores are placed at the top of the list. Analysis of Table 5.6.15 reveals that the majority of British Independents (18/21) hold a licence in a corrupt and/or politically unstable country. It is interesting to note that of those countries (9/64) chosen by Independents due to *Low Competition* for licences, all were found to have low corruption and political stability scores (Table 5.6.16). As Section 6.4.7 discusses, poor governance in a country may discourage investment and result in lower competition for licences.

Countries where Low Competition was Reported to have Influenced Selection		
Country	*Corruption Score*	*Political Stability Score*
Bangladesh	1.3	-0.57
Bolivia	2.3	-0.61
Bulgaria	3.9	0.37
Ghana	3.3	-0.11
Indonesia	1.9	-1.56
Montenegro	2.3	-
Poland	3.6	0.69
Romania	2.8	-0.08
Russia	2.7	-0.41

Table 5.6.16

Propensity of Independents to Engage in Corrupt and/or Politically Unstable Countries							
Company	*Western*	*Non-Western*	*Average Corruption*	*Average Stability*	*Corruption Rank* (CR)	*Stability Rank* (SR)	*Average Combined Rank* (CR+SR)/2
Sibir Energy	-	Russia (2.7, -0.41)	2.7	-0.41	2	3	2.5
Regal Petroleum	Romania (2.8, -0.08)	Ukraine (2.3, -0.59)	2.6	-0.34	1	5	3
Premier Oil	UK (8.7, 1.10), Albania (2.5, -0.60)	Gabon (na, -0.44), Guinea Bissau (na, -1.21), India (2.8, -0.05), Indonesia (1.9, -1.56), Myanmar (1.6, -1.20), Pakistan (2.5, -0.39)	3.3	-0.56	5	2	3.5
Emerald Energy	-	Colombia (3.7, -1.36)	3.7	-1.36	7	1	4
Tullow Oil	UK (8.7, 1.10), Romania (2.8, -0.08)	Cote d'Ivoire (2.1, -0.95), Gabon (na, -0.44), Cameroon (1.8, -0.13), Algeria (2.6, -1.27), Pakistan (2.5, -0.39), India (2.8, -0.05), Bangladesh (1.3, -0.57).	3.1	-0.31	4	6	5
Global Energy Development	-	Peru (3.7, -0.23), Panama (3.4, 0.57), Colombia (3.7, -1.36)	3.5	-0.34	6	4	5
Soco International	-	Vietnam (2.4, 0.44), Mongolia (na, 0.72), Thailand (3.3, 0.21), Yemen (2.6, -1.07), Tunisia (4.9, 0.82), Libya (2.1, -0.38).	3.1	0.12	3	9	6
JKX Oil & Gas	USA (7.5, 1.18), Italy (5.3, 0.82)	Ukraine (2.3, -0.59), Georgia (1.8, -1.00)	4.2	0.10	9	7	8
Aminex	USA (7.5, 1.18)	Russia (2.7, -0.41), Tanzania (2.5, -0.34)	4.2	0.14	8	11	9.5
Cairn Energy	UK (8.7, 1.10)	India (2.8, -0.05), Bangladesh (1.3, -0.57).	4.3	0.16	11	12	11.5
Dragon Oil	-	Turkmenistan (na, 0.11)	na	0.11	na	8	na
Dana Petroleum	UK (8.7, 1.10), Ireland (7.5, 1.24), Faeroe Islands (na), Netherlands (8.9, 1.48), Australia (8.8, 1.26).	Russia (2.7, -0.41), Kenya (1.9, -0.83), Mauritania (na, -0.87), Ghana (3.3, -0.11), Indonesia (1.9, -1.56).	5.5	0.14	14	10	12
Ramco Energy	Ireland (7.5, 1.24), Poland (3.6, 0.69), Czech Republic (3.9, 0.74) , Montenegro (2.3,na), Bulgaria (3.9, 0.37)	-	4.2	0.76	10	17	13.5
Melrose Resources	USA (7.5, 1.18), Bulgaria (3.9, 0.37)	Egypt (3.3, 0.21)	4.9	0.59	13	14	13.5
Pan Andean Resources	USA (7.5, 1.18)	Bolivia (2.3, -0.61)	4.9	0.6	12	15	13.5
Paladin Resources	UK (8.7, 1.10), Norway (8.8, 1.32), Denmark (9.5, 1.34), Romania (2.8, -0.08).	Tunisia (4.9, 0.82), Indonesia (1.9, -1.56)	6.1	0.49	15	13	14
Venture Production	UK (8.7, 1.10)	Trinidad (4.6, 0.27)	6.7	0.69	16	16	16
Sterling Energy	UK (8.7, 1.10), USA (7.5, 1.18), Canada (8.7, 1.24), Netherlands (8.9, 1.48)	Philippines (2.5, -0.21)	7.3	0.96	17	18	17.5
Northern Petroleum	UK (8.7, 1.10), Italy (5.3, 0.82), Spain (6.9, 1.01), Denmark (9.5, 1.34)		7.6	1.07	18	19	18.5
Desire Petroleum	Falkland Islands (8.7, 1.10)		8.7	1.10	20	20	20
Edinburgh Oil & Gas	UK (8.7, 1.10)	-	8.7	1.10	20	20	20

Key:
(x, y) x = CPI 2003 Score, red (x < 5), blue (x > 5) y = Political Stability score, red (y < 0), blue (y > 0)
Red = high corruption / high political instability Blue = low corruption / low political instability

Table 5.6.15

Beyond the general tendency of British Independents to have some involvement in a politically unstable or corrupt country, closer examination of Table 5.6.15 reveals certain Independents (Sibir, Regal, Premier, Emerald, Global Energy, Tullow and Soco) to exhibit an affinity towards such countries (see Section 6.4.7). Nevertheless, the strongest example of this orientation towards politically unstable countries is demonstrated by Independent α (see Exhibit 5.6.1). Although technically situated outside the Independent population (Section 2.1)[7], its willingness to engage in politically unstable countries was strikingly similar to the above referenced Independents. However, unlike other interviewees, the Chief Executive of Independent α disclosed more intimate detail as to how his firm managed risk. The case-study which follows provides privileged insight into how smaller firms can leverage advantage in such environments.

Exhibit 5.6.1 – Case-Study Independent α

Independent α was a start-up exploration and production company seeking to invest in Iraq. Although outside the Independent population designated by this study, an interview with the Chief Executive of this firm revealed it to exhibit a strong preference for countries with high political/security risks.

Having previously sought interests in Sudan, Yemen[1], Syria and Uganda, the interviewee acknowledged "[we] go places others won't go". He reported there was less competition in these countries; they were neglected by larger Majors because of the publicity risk they would face. Majors do not want to engage in countries that would result in negative publicity of the sort that might make the "front page of the FT"[2].

Explaining why Independent α was able to undertake work in such risky environments, he stated "risk is about perception". Political / security risks can be managed if the appropriate method is adopted. On the "surface" we take on "higher risks", but in reality it is because we "control risks better". When detailing how the firm could operate without hindrance in Iraq, he stated their policy was to "stay at smaller hotels, seek protection, keep low profile". In contrast, he noted that Majors were "more targeted for kidnapping and attack, as [they] stay in the main hotels".

[1] The British Independent Soco International is also engaged in Yemen.
[2] In contrast Premier Oil would take such risks, for example, its willingness to undertake licences in non-democratic Myanmar (FT 15/5/98) and Cuba (APJ 11/3/98).

[7] This was because at the time of sampling Independent α was not in possession of any licences (Operated or Non-Operated) upon which activity was being undertaken.

Exhibit 5.6.1 – cont'd.

A further method employed to reduce threat was local engagement. "Basic way is to provide jobs, talk to local tribes, work with local tribes and hire their people". Beyond the importance of *Accessing the Appropriate Government Official,* the firm also channelled its efforts towards *Accessing the Appropriate Local Chief.* Independent α would aim to "go through the local chief," who held tribal authority over the licensing area. Inclusion of local tribes into the projects was noted as a key strength in their method of mitigating political / security risk[3].

Beyond methods to reduce political / security risk, Independent α was found to embody the *relationship approach factor*, identified in this study as a key strength of Independents negotiating in Non-Western countries (Section 6.5.4). During his company's negotiations with the Iraqi Petroleum Directorate, the interviewee reported a "willingness to socialise" with officials was a necessity. In Iraq, there is "less of a division between family and business". "If invited to home or restaurant, [you] must accept and show you enjoy…basic courtesy". Strong relations with officials in the Petroleum Directorate were essential, you "can't do business unless you get on well with senior people". To facilitate these relationships, Independent α was sensitive to the Petroleum Directorate's needs. For example, when the Directorate's printer was running low on toner, Independent α brought replacement cartridges from Britain - such cartridges were not easily available in post-war Iraq. Further assistance included the bringing of old "Economist or Newsweek" magazines and old "medical journals", the latter being gratefully received by local Iraqi hospitals. Although these gestures pertain to a form of gift aid, they are situated within an overall *relationship approach* that is reported as a negotiating strength particular to Independents (Section 6.5.4).

[3] Independent L reported a similar policy of hiring a "lot of local staff" for it assisted in "lowering security risk", they are "more happy to co-operate with us".

PART 3 INTERPRETATION AND CONCLUSIONS

6. INTERPRETATION OF EVIDENCE

6.1 STRATEGIC DECISION-MAKING SPEED & RAPIDITY OF ACTION

6.1.1 Decision-Making Speed

6.1.1.1 Speed of Decision-Making: Independents vs. Majors

The qualitative results analysed in Section 5.3.1, indicate Independents to be faster in their decision-making than Majors. All Independent interviewees, who had previously worked for Majors, stated decision-making speed, for every operation, to be faster within the current Independent (Table 5.3.1). Drilling Contractors confirmed this. Each interviewee specified decision-making speed, for most operations, were faster among Independents (Table 5.3.4). Drilling Contractors reported one of the greatest strengths for undertaking contracts with Independents was their decisiveness (Fig 5.3.1). In contrast, the greatest weakness of undertaking contracts with Majors was stated to be their slow decision-making speed (Fig 5.3.2).

Seeking the cause of this temporal differential the range of structural factors reported by Independent and Driller interviewees warrants attention (Table 5.3.1 & Table 5.3.5). One of the most prominent factors referenced was the *Spectrum of Consultation*. The larger "team size" of Majors (Independent D) resulting in decision by "committee" (Contractor A and C). In accordance with the concept of centralization (Wally and Baum, 1994), the concentration of decision-making authority was also reported to be of influence. The "fewer layers of management" (Independent K) present within Independents, were recognised as a source of rapid decision. In contrast to the clarity of decision-making authority in Independents, individual personnel in Majors were recognised to be unwilling to make decisions on their own (Contractor A). Vertical specialization (Mintzberg,1981), the extent to which a worker lacks control of the tasks he/she performs, thus appears to be high for the Majors. This finding corresponds with Mintzberg's predictions of divisionalized bureaucracy, a structural configuration characteristic of extremely large corporations. Another causal element, acknowledged by interviewees, was formalization. In support of Wally and Baum's (1994) results, formalization of work practices was commonly referred to (Table 5.3.1 and Table 5.3.5) as a further feature causing the slower speed of decision-making among Majors. Our

examination of the formalization of the tendering processes confirmed this result. Majors' tendering selection procedures were found to be more formally based than Independents' procedures (Table 5.3.6 and Fig 5.3.3) (t-statistic = 3.057; Prob.value = 0.022). The objective of this augmented formalization was rationalised by interviewees as a system to ensure consistency and to protect Majors against poor decisions. Analysis of comments made by interviewees revealed that vertical specialization in Majors was also accompanied by horizontal specialization (Table 5.3.5). Thus many of the jobs within the organization encompassed only a few narrowly defined tasks (Mintzberg, 1981). This propensity for horizontal specialization carried an additional implication. Driller interviewees reported aspects such as safety, insurance, and legal terms and conditions, on occasion, to receive excessive emphasis by Majors. The cause of this emphasis was related to individuals in these departments being somewhat "territorial" with respect to their field of expertise (Contractor B). Another interviewee observed a "lot of job protection going on" through the excessive "pointing out of mistakes" (Contractor A). The impact of this unwarranted attention was reported by drilling interviewees to be an unnecessary prolonging of the overall decision process. Peters (2001) notes this as common in bureaucratic administrative structures, where refusal to take personal initiative outside of regulated authority is a consequence of lower echelons protecting themselves from their superiors (Section 5.3.1). Further sources of causation which were referred to include spatial proximity and focus. Some interviewees noted that the spatial proximity of decision-makers (e.g. as in, all being in the same office), tended to facilitate communication and to hasten decision speed. This accords with communication studies noted by Monge and Contractor (1998), which find proximity enhances the likelihood of communication, by increasing the probability that individuals will meet and interact (Festinger et al, 1950; Zahn, 1991; Van den Bulte and Moenaert, 1997). Focus was most frequently mentioned regarding Independents' smaller portfolio of assets. Making specific reference to business development and the bidding for new ventures, interviewees noted that the capital allocation process became more rapid. Considering fewer prospective assets at any given time enabled the Independent to consider each prospective investment opportunity on its own basis. Such focus was noted to be a further cause of the speed differential.

The above findings suggest that a range of structural causal variables have influence on the decision-making speed differential. These include: *Spectrum of Consultation*, *Centralization* (concentrated decision-making authority), *Vertical Specialization*, *Formalization*, *Horizontal Specialization*, *Spatial Proximity*, and *Focus*. Although the current research design has specifically targeted the structural aspects of *Spectrum of Consultation* and *Focus*, future research in the area may seek to determine the weighting of these factors relative to the other causal variables identified by the Independent and Driller interviewees.

6.1.1.2 Speed of Decision-Making: Small vs. Large Independent

This section seeks to ascertain whether differences in decision-making speed may also be detected within the Independent population. According to Wally and Baum (1994) firm size (as measured by Head Count), is significantly correlated with decision-making speed ($p < 0.01$). That is, the larger the firm, the slower the decision-making speed. Qualitative results, reported in Section 6.1.1, suggest this feature of firm size holds between the small Independent and the large Major. Inspection of the Independent sample produces a similar finding. Results shown in Table 5.3.11, suggest that the larger the firm size (as measured by Head Count), the longer the time taken to decide upon a course of action. An independent sample t-test of mean differences in Head Count between fast (<1Day) and slow (≥1Day) decision-making firms, confirmed this result ($t = -2.422$; Prob. value = 0.033). This result thus suggests that the larger the firm size of the Independent, the slower the speed of decision-making.

6.1.1.3 Spectrum of Consultation

Section 5.3.1.1 results suggest support of Hypothesis 3(a) that the greater the number of personnel consulted to enact a given decision, the longer will be the time taken to choose a course of action, and rejection of the null hypothesis of no relation between number of personnel and action time (Prob. value < 0.05) (Table 5.3.9). Accordingly, Eisenhardt's (1989) generalised criticism of March and Olsen (1981) and Janis (1982) (See Section 3.1) appears misplaced. By contrast, our results imply the length of the decision process

is influenced by the number of personnel consulted. Further support for this is readily identified at the extremes, when comparison is drawn between Independents and Majors. For example, decision by "committee" was a common causal force referenced by Drilling interviewees, recounting experiences of slower decision-making among Majors.

Section 3.1, argued that the number of personnel consulted, for a given decision to be made, was influenced by the size of the firm. Hypothesis 3(b) held that: The larger the firm size, the greater will be the number of personnel consulted for making a given decision. The reasoning behind this was that as a firm increases in size, there is typically a move towards an increased division of labour (Reid, 1989). What Mintzberg (1981) notes as the propensity of larger firms to engage in horizontal specialization. A by-product of this specialization is the dispersal of information. For a decision to be fully informed, the required information[1] must be gathered from all the relevant parties. Work specialization, through reducing the scope of task constituted by an average job, thereby spreads the necessary information across a larger number of individuals. In consequence, when a decision of strategic proportions is required, a larger number of individuals needs to be consulted. The results analysed in Section 5.3.1.1 support the above interpretation. For both 'test-well' and 'scenario' cases *Firm Size* measures are positively and significantly correlated with the *Number of Personnel Consulted.* These correlations (Table 6.3.12), together with the associated linear regressions (Table 5.3.A-B and Fig 5.3.A-B), suggest rejecting the hypothesis of no relation between firm size and number of personnel consulted; thereby accepting Hypothesis 3(b). Evidence of increased horizontal specialization amongst the larger Independents may be extracted from Tables 5.3.7-8. For example, in both the 'test-well' and 'scenario' cases, only the two largest Independents report inclusion of a specialist Health, Safety and Environment head of department in the consultation process. Similarly, among the larger Independents, the increased specialisation of personnel in their Exploration and Finance departments is also suggested (see Tables 5.3.7-8). Thus, whilst task specialization may stimulate efficiency gains for routine, standardised decisions, for decisions of strategic magnitude, the

[1] Here 'Required information', is considered as that generated by individual personnel through application of their particular skills, knowledge, and experiences.

existing task specialised framework results in more personnel being consulted and a slowed decision-speed. Collection of information is not a free operation; the process of gathering it imposes a temporal information-search cost.

7.1.1.4 Focus

If all agents are limited more broadly, in their cognitive capacity, and more narrowly, in their computational capacity (Simon, 1955) (i.e. there is 'bounded rationality'), then as Gifford (2001a; 2001b; 2001c) reports, there are boundaries to the *attention* a manager can give to any problem/task. A manager's attention is a scarce resource. Whilst Simon (1955) is concerned with problems where an optimal solution is infeasible, because of the complexity of the problem, Gifford (2001a) addresses problems for which an optimal solution is possible, but costly. The cost measured, is that of limited managerial attention. The problem she sets concerns the allocation of limited attention among a number of projects. An analogy of juggling plates is suggested, the choice being to set up further spinning plates, or to re-spin existing ones before they hit the ground. With a manager's evaluation attention being limited, congestion and overload may occur. Projects can be retained, or discarded unevaluated, whilst attention is focused upon an existing or new project. Implicit within this concept is the notion of time and quality of decision. Overload, too many simultaneous projects, can result in poorer decisions (a project is discarded unevaluated), or delay (a project is retained unevaluated). Managerial focus on fewer projects is therefore associated with improved decision quality and speed of decision. For the British Independents our results show *Focus* to be positively correlated with *Firm size* variables (Prob. value < 0.05) (Table 5.3.13). Hence, the smaller the Independent firm, the greater the degree of focus. Turning to Hypothesis 3(c) we find that the greater the degree of focus of a key decision-maker in the organisation, the more rapidly will decisions be made. Although the relationship between *Decision-speed* and *Focus* was of the appropriate sign (-0.25), a Prob. value of 0.47 provided insufficient evidence to reject the Null Hypothesis of no relationship between these variables. However, the research of Gifford (2001a; 2001b; 2001c) refutes this finding and shows managerial focus to reduce decision delay. With scenario response times showing faster decisions to be made among the smaller Independents (Table

5.3.11) (Prob. value = 0.033), in accordance with Gifford, I reason that this result may also be influenced by the greater degree of managerial focus in these smaller firms.

6.1.1.5 Speed versus Quality?

Although rapid decision-making is typically associated by researchers with enhanced performance (Eisenhardt, 1989; Judge and Miller, 1991; Stalk, 1988), the quality of the resulting decision has received limited attention. Wally and Baum (1994) accept that fast decisions may diminish decision accuracy. However, they side-step its implications by referencing Smith et al (1991), who notes accuracy may not be of value, if it is mistimed. Indeed, timing is likely to be critical for certain strategic decisions made by Independents. This may be particularly true of the business development activity of bidding for new licences, where the 'window of opportunity' (Wickham, 2001), may be of limited duration. This activity, considered by interviewees to be a site where Independents' decision-making is particularly fast relative to Majors, is more closely analysed in Section 6.4. In accepting the 'timing' reasoning of Wally and Baum (1994), the mutual importance of both speed and decision quality for actions such as test-well drilling, should not be underestimated. A measure of decision-quality for this thesis, is the exploration success rate of Independents. With results of the success rate for the Independents' last five exploration test wells measuring 55% (Table 5.3.14), decision-quality does not appear to be a concern, as this figure corresponds with the success rates calculated by Forbes and Zampelli (2000; 2002) of 55% (1995) and 55.4% (1998) for Majors US offshore and onshore exploration respectively. Thus, the quality of decision made by Independents is close to that of Majors. A possible interpretation is that uncertainty (Knight, 1921), as proposed by McKie (1960), may serve to equalise their exploration success rates. Firms may apportion risk probabilities to calculate expected monetary values of differing exploratory drillings, but even these probabilities are subject to Knight's non-actuarial uncertainty. Beyond the concept of uncertainty, the feature that further complicates determination of the variables influencing decision accuracy is the capability of the individual human agents. Certain decision-makers may be highly sophisticated in their analysis, as one interviewee commented a "star" analyst might be found in any organization, regardless of size. Indeed, Wally and Baum (1994) attempted

to measure cognitive complexity with respect to decision-making speed, but found no relationship. Measuring the individual innate ability of members in any team remains beyond the bounds of research. A small team of star analysts in an Independent could theoretically outperform a larger team made up of lower individual talents. What counts is the efficacy of the final decision, not the means to the end.

6.1.2 Action

6.1.2.1 Stimulus to Action

The factor found to most stimulate British Independents to reduce the time between award of licence and producing on-line was *Cashflow* (Table 5.3.15). The predominance of *Cashflow* as the principal stimulus to action can be explained from a Net Present Value (NPV) valuation approach. NPV calculates the present value of a project according to the timeliness of the *Cashflows* that will be produced. Future *Cashflows* are discounted according to the particular year in which they will occur. The further in the future that a *Cashflow* occurs, ceteris paribus, the lower its present value. For the NPV approach, the variable used to calculate present project values, is the *Discount Rate*. Traditionally it is estimated according to three factors: Risk, Interest Forgone, and Inflation (Atrill and McLaney, 2001, p. 278). These factors serve to reduce the prospective value of future *Cashflows*. To demonstrate how the *Discount Rate* may be applied, a hypothetical successful exploration programme is displayed in Table 6.1.1.

Calculating NPV			
Time	*Cashflow (£m)*	*Discount Factor*	*Present Value*
Immediately	(1)	$1/(1+15)^0 = 1$	(1)
1 year's time	(10)	$1/(1+15)^1 = 0.870$	(8.7)
2 year's time	2	$1/(1+15)^2 = 0.756$	1.512
3 year's time	16	$1/(1+15)^3 = 0.658$	10.528
4 year's time	20	$1/(1+15)^4 = 0.572$	11.44
5 year's time	20	$1/(1+15)^5 = 0.497$	9.94
			NPV = 23.72
Discount rate (r) = 15%	n = year	Discount Factor = $1/(1+r)^n$	

Table 6.1.1

Table 6.1.1 shows that the later in *Time* that a *Cashflow* occurs, the higher the *Discount Factor*. For example, the £16m received in year three, has a greater *Present Value* (£10.53m), than the £20m received in year five (£9.94m). Thus, the faster a company brings production on-line, the greater the *Present Value* of the associated *Cashflow*. The

presence of a *Discount Factor*, $1/(1+r)^n$, in the NPV calculation demonstrates that there is a cost to slow action.

The second most important stimulus to action was *Production Targets* (Table 5.3.17). An unsurprising result when one considers Parkinson's Law (1957) which argues that work expands to fill the time available for completion. According to Parkinson, a task without defined time limits has the tendency to stretch to the maximum amount of time given. From this perspective the issuance of *Targets* tends to initiate faster action. Privately, *Production Targets* were frequently used by Independents (Section 5.3.3), and Independents acknowledged, they did hasten action (Table 5.3.17).

Contrary to expectations, *Cost of Capital* was not as significant a stimulus to action as either *Cashflow*, or *Production Targets* (Table 5.3.17). Thus the view that the greater the financial pressure of debt borne by Independents, the greater the stimulus to fast action, is thereby challenged. Further support for this challenge is given by the finding that the mean gearing for the Independent population was very low, at only 11.47% (Table 5.1.14). Thus, the results suggest that financial pressure, in the form of debt, is not the key stimulus to fast action by Independents.

The overall level of gearing was, however, positively correlated with firm size (Prob. value = 0.000). Closer examination of the results reveals that whilst virtually all British Independents below a market capitalization of £60m had no gearing (8/9): the majority of Independents (10/12) above a market capitalization of £60m did. Support for such a finding is demonstrated in the work of Michaelas et al (1999). Analysing a broad set of SME's (N=3500), from a variety of different UK business sectors, they found a positive relationship between the size of a firm and the gearing ratio it is able to achieve and maintain (Prob. value = 0.011). Their conclusion is that, smaller firms face higher financial barriers. Further explanation as to the nature of these barriers may be drawn by using the concept of *Credit Rationing* (Stiglitz and Weiss, 1981; Calomiris and Hubbard, 1990). *Credit Rationing* theory starts with the phenomenon of there being asymmetric information between borrowers and lenders. This asymmetry increases the potential for

adverse selection, and thus encourages limits to be placed upon the number of loans a lender will issue (Stiglitz and Weiss, 1981). Under these circumstances, lenders prefer borrowers with significant financial resources and reputations (Calomiris and Hubbard, 1990). For such financially secure borrowers, project sizes tend to be small relative to the borrower's net worth. Assured by the greater levels of collateral with which a larger firm can secure a loan, lenders are thus more willing to lend. With the cost of a £10m exploration drilling being high relative to the average Independent's Net Assets (£83.17m), the limited net worth of the several Independents beneath a Market Capitalization of £60m may explain the absence of gearing. Lenders may be less willing to lend to firms of that size. Combined with lenders' aversion to risky economic sectors (Lopez-Gracia and Ayabar-Arias, 2000), the smaller British Independent is likely to experience *Credit Rationing* more intensely than the larger British Independent.

Results showed (Table 5.3.17 & Table 5.3.18) North American Independents to rank *Competitive Advantage* as a more important stimulus to fast action than do British Independents. This greater emphasis upon *Competitive Advantage* may reflect a different behavioural attitude among North American compared to British Independents. The greater competitive drive of North American firms may be a consequence of the organizational culture that is commonly propagated in North American approaches to business (e.g. through leading business schools). Particular societies do give rise to particular organizational cultures[2]. Although, it is beyond the limits of this research to determine the precise nature of the difference between British and North American Independents' organizational culture, as regards the particular *traits* and/or *perceptions* that are propagated, our evidence is suggestive of a promising channel of future enquiry.

6.1.2.2 Factors Slowing Action

The most important factor holding up the time between award of licence and first test well drilling was found to be *Block significance relative to partner firms' total portfolio.* This result is in accord with the initial inductive research (Patrick, 2003; HCSC, 1988a)

[2] Kay (1993), for example, notes the difference in business practices between North America and Japanese firms (See Section 6.2).

which suggested that, action upon licences can be delayed, when the Operator of a licence asserts it to be of lower potential value relative to other licences, within its portfolio. Proponents of this view typically made reference to those joint ventures where a Major holds the position of Operator and an Independent the role of Non-Operator. To reiterate the view of Barry (1993, p.5) 'it is quite difficult for the Non-Operating partners to get the Operator to initiate something against its will.' In contrast, the position held by the Operator gives them authority over both the 'size' and 'timing' of work programmes (Barry, 1993, p.5). Holding large global portfolios of assets, including licences viewed as assets[3], Majors can be selective with respect to the channelling of intra-firm investment. Thus only certain licences within their portfolios will receive investment. Independents, with their much smaller asset portfolios do not have such a luxury. Compared to a Major each single licence held by an Independent is representative of a greater proportion of the Independent's total assets (including licences). As a consequence, each licence has a greater probability of investment deepening.

Taking the UK as an example, research by consultants HannonWestwood has found Majors to consider, on average, 60% of their licence holdings within the UKCS to be Non-Core (Hannon, 2003) (see Fig 6.1.1). Non-Core in this context means that the company no longer considers the property (licence) to fit strategically the company's asset portfolio; and as a consequence, they are unwilling to invest in it. Moving right on the chart to the smaller companies, a similar situation is not found for the Independents. Indeed, HannonWestwood record, on average, no more than 30% of Independents' licence holdings within the UKCS to be Non-Core. This means 70% of Independents' assets within the UKCS are considered as Core holdings by their Independent owners and therefore *will* receive investment.

[3] Licences reserve a right to drill (and/or to exploit). Even if unexploited, the licence has prospective value (as an entitlement to invest, in a real options sense) and therefore have positive value as financial paper, and can be sold on. In this sense, they are financial assets.

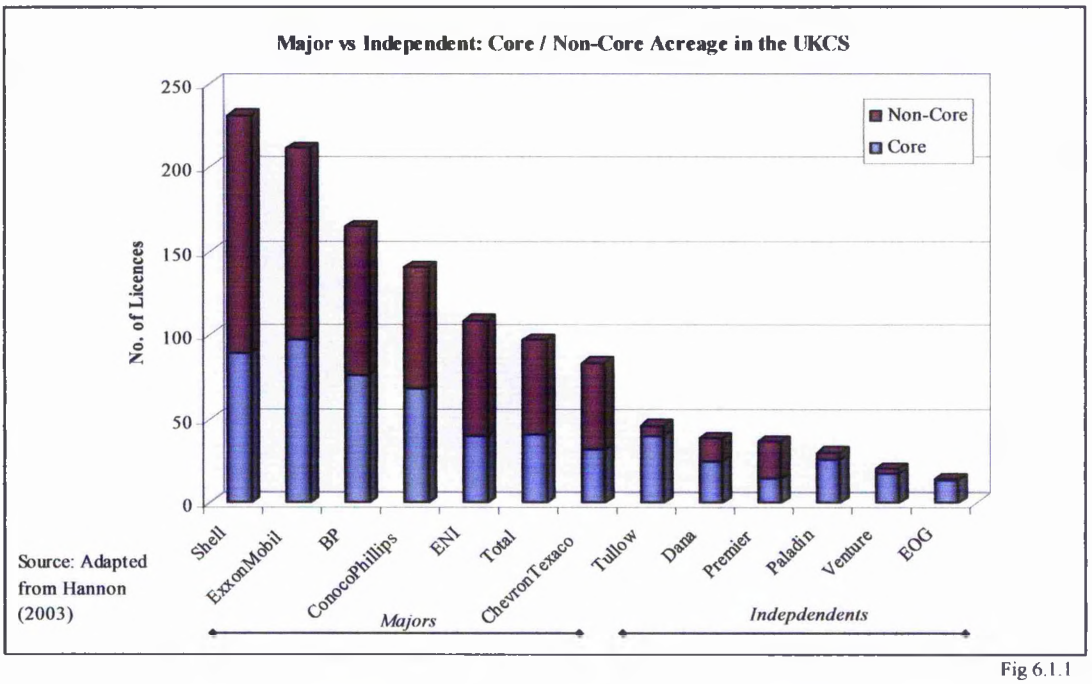


Fig 6.1.1

With a greater number of licences, Majors can be selective as to which of their licences receive investment (Core acreage). A consequence of this greater choice is that Majors can set higher thresholds of return. Newendorp (1996) notes an Independent Operator will more frequently drill a test-well that a Major did not wish to drill, even though the same expected monetary value (EMV)[4] was determined by both firms. Thus, a licence could be considered Core by an Independent, yet Non-Core to a Major. This is because the EMV falls below the Major's investment threshold. Using industry terminology, this characteristic is referred to as *Materiality* (Zanoyan, 2004); meaning smaller companies have lower EMV thresholds relative to large firms. As Roy Franklin CEO of Paladin reported, the small size of the assets sought by Paladin are "just not material for BP" (Franklin, 2003). The second most important factor for slowing action was reported to be partner approval, the final process of getting all partners to agree on a course of action to be undertaken. The importance of this factor accords with the work of Eisenhardt (1989), who found the efficacy of dispute resolution to influence the speed of decision-making.

[4] Expected monetary value of an outcome is the product of the probability that the outcome will occur (exploration success), and the conditional value (worth) that is received if the outcome occurs (Newendorp, 1996).

6.1.2.3 Action Measured

Results show Independents to be rapid in their action (Section 5.3.3). For both Independent Operated and Non-Operated licences, the time differential between award of licence and first successful test-well (O1, N1), and the time differential between a successful test-well and production on-line (O2, N2), are each found to be less than 2 years. Being well within the 4 years permitted by the UK DTI for each of these activities, Independents may be considered to be relatively rapid in their actions.

The time taken for the Field Development Decision (FD) was also short: on average, it took only 1 year to complete. However, British Independents are slow in comparison to the North American Independents. The latter Independents only took 6 months for the same Field Development Decision. An explanation for this differential can be sought in the time spent by firms on *Raising Financial Capital* and *Sales Arrangements.* On average North American Independents spent only 4 days *Raising Financial Capital,* whereas British Independents spent 48 days for the same task. The cause of this discrepancy may be related to firm size. Following the concept of credit rationing discussed earlier (Calomiris and Hubbard, 1990), being larger in size, North American Independents have more collateral against which a loan can be secured. This circumstance is likely to augment the willingness of lenders to advance funds in debt finance form to North American Independents. Consequently, North American Independents spend less time *Raising Financial Capital* than their British equivalents. Beyond firm size, a further aspect that may contribute to the difference between British and North American Independents is the strong evidence for credit rationing within the UK. HannonWestwood report North American banks to be even less inclined to lend into the UK than UK based banks, and this leaves local UK lenders with a "pretty closed system to exploit." (Hannon, 2003). Such a system may also prolong the time spent by British Independents in *Raising Financial Capital.*

Turning to *Sales Arrangements,* on average, North American Independents spent only 25 days making *Sales Arrangements*, whereas British Independents spend 109 days on the same task. This difference may also be a consequence of firm size. Among British

Independents, it has been found that the greater a firm's production, the higher the average price received per barrel (Prob. value = 0.044). From Porter's (1985; 1998) work on bargaining power, if a buyer knows that it is the sole buyer available to a particular supplier, then this knowledge can be used to bargain down the price paid. With small sized Independents having low petroleum production, a buying refinery will be aware "small volumes" can only be sold to one refinery (Independent D). Moreover, with such small volumes being relatively "insignificant" to the buying refinery (Independent D), the buyer holds the advantage. Here, the contract is more crucial to the small Independent than to the refinery. The outcome of this bargaining differential is that smaller producers receive a lower average price per barrel than larger producers. Larger producers produce in sufficient quantity that their supply becomes significant to refineries. Moreover, the quantity is such that it may now be apportioned between one or more refineries. Thus large producers, being less reliant upon a sole refinery, have a stronger bargaining position, and may extract a higher price. Similarly, the smaller production of British Independents vis-à-vis North American Independents is likely to place British Independents in a weaker bargaining position with refiners. This weaker position may explain the greater time that is dedicated by British Independents to *Sales Arrangements*.

6.1.2.4 Capital Constraint

Overall, examination of the activities undertaken by Independents leads to the suggestion that these firms are resource constrained. Independents are found to hold more of the less resource intensive Non-Operated licences, than of the resource intensive Operated licences (t-statistic = -1.893; Prob. value = 0.07). Taking a sample of these licences, results suggest Independents may utilise the less resource intensive role of the Non-Operator to enter into more complex exploration drillings. For example, Non-Operated licences involve more partners in the joint venture and tend to be undertaken in deeper water than Independent Operated licences. Further supporting evidence for the resource constraint exhibited by Independents, resides in the finding that only one Independent, following an unsuccessful exploration test well as Operator, reported that it had continued to explore under the same licence. McCray (1975) and Newendorp (1996)

interpret such an approach to be characteristic of firms with limited capital, essentially those which need to be careful to avoid the possibility of 'Gambler's ruin'. To re-iterate, 'Gambler's ruin' is the possibility of a long series of chance consecutive losses such that the gambler loses all his money and must drop out of the game. One preventative measure to avoid such a circumstance is for the company to leave the licence, if its first test-wells prove dry (Newendorp, 1996, p.539). The alternative is to seek and attain a larger supply of finance capital, so that should a period of sequential losses transpire, the firm can sustain itself until eventual success. With Independents experiencing capital to be in limited supply, obtaining extra finance is often not an option. Unlike the capital rich Majors, Independents cannot always sustain sequential losses. To illustrate, consider the following example adapted from Newendorp (1996). Suppose there are two firms: Independent X and Major Y. Independent X has £20m available to explore for oil in a new area, whilst Major Y £50m. The prospective area has the following parameters:

1. Exploratory dry hole costs = £10m each
2. Number of prospects (anomalies): N = 20

   Fraction of prospects expected to contain enough oil to be classified as a significant commercial (£100m) discovery: p = 0.25.

From this data the maximum number of consecutive failures that Independent X can sustain is 20/10 = 2 and for Major Y it is 50/10 = 10. The estimated number of possible discoveries is N × p = 20 × 0.25 = 5. The corresponding number of likely dry prospects is N × (1 - p) = 20 × (1 - 0.25) = 15. Table 7.1.2 expresses the conditional probability terms for the scenario of 5 wells being drilled in the given area.

Conditional Probability Terms		
Probability Term	*Meaning of the Probability Term*	*Numerical Value*
$P(F_1)$	Probability 1st well is dry	15/20
$P(F_2)$	Probability 2nd well is dry, given 1st one was dry	14/19
$P(F_3)$	Probability 3rd well is dry, given first two were dry	13/18
$P(F_4)$	Probability 4th well is dry, given first three were dry	12/17
$P(F_5)$	Probability 5th well is dry, given first four were dry	11/16

Table 6.1.2

Probability of n = 2 consecutive failures (Independent X):

$$= P(F_1) \times P(F_2) = \frac{15}{20} \times \frac{14}{19} = 0.553$$

Probability of n = 5 consecutive failures (Major Y):

$$= P(F_1) \times P(F_2) \times P(F_3) \times P(F_4) \times P(F_5) = \frac{15}{20} \times \frac{14}{19} \times \frac{13}{18} \times \frac{12}{17} \times \frac{11}{16} = 0.194$$

By participating in 3 additional wells Major Y has a much lower chance of Gambler's ruin (19%) than Independent X (55%). The above example reveals how an Independent's limited financial resources may result in an early exit from an area where initial exploration drilling proved unsuccessful.

Further evidence pointing to the limited financial resources of Independents pertains to the number of appraisal wells drilled. Results suggest fewer appraisal wells are drilled by Operating Independents, than for licences they have entered as Non-Operator (Table 5.3.25). Appraisal wells, undertaken after a successful exploration drilling, assist the Operator to determine the size of the field. This knowledge enables the Operator to develop the right scale of infrastructure necessary for the field. However, as Iain Patrick related, appraisal wells reduce risk, but are costly to implement. Indeed, he acknowledged that some Independents may not have "enough cash" to undertake such work. The fewer appraisal wells drilled by Independents, when acting as Operator, as against when they are Non-Operator, could be a consequence of the Independents' capital constraint.

The final evidence confirming the suggestion that Independents are noticeably restricted in their capital resources was presented by drilling interviewees. Whilst *Financial Security* was the greatest strength for a driller undertaking a contract with a Major (Fig 5.3.7), *Payment Default* was the greatest weakness for a driller undertaking a contract with an Independent (Fig 5.3.6).

6.1.2.5 Firm Size and Speed of Action

In testing Hypotheses 3 (d) and 3 (e) a statistically significant relationships could not be found between measures of firm size and speed of action. The evidence was not technically sufficient to reject the null hypotheses of no relationship. Nevertheless, the positive sign displayed by the majority of coefficients between firm size variables and rapidity of action measures O1 and O2 do suggest that as the size of the Independent firm increases, speed of action slows (Table 5.3.33). Reviewing the results for decision-making speed and rapidity of action it appears smaller firm size is associated with both faster decisions and faster action. A key competitive strength of the Independent is thus its ability to *make* and *enact* swift decisions.

The only deviation from this observation might be for the resource intensive *Field Development Decision*. In this situation, the capital constraint faced by smaller Independents does appear to have a temporal effect. Results suggest that for this action, larger firm size may be associated with speedier implementation (Table 5.3.33). Indeed, not all interviewed Independents had undertaken field development; it remained a resource intensive task that some firms specifically avoided (for example, Independent J). This finding is useful in terms of the clarification it presents, for it suggests that whilst small firm size is associated with speedy actions, these actions can be delayed should the firm engage in activities that exceed its current resource capabilities. Independents do *enact* swift decisions, but in circumstances where the action requires a step-change in the firm's capital resources, delays may be a possibility.

6.2 UTILISATION OF CONTRACTORS

6.2.1 The Trio of Capability

With Section 5.4.1 having identified the functional strengths of Independents, namely those functions that are provided in-house, this section seeks to determine why it is these functions have been internalised. Explanation is formulated along two avenues: (1) Richardson's resource-based schema, and (2) Williamson's transaction cost framework.

Using Richardson's resource-based framework (1960, p.231), three primary layers of generic capability can be recognised for Independents. (1) The first layer, pertains to the four functions that are predominantly provided in-house, namely: Financial, Commercial, Human Resource Management (HRM) and Procurement. In aggregate, a degree of similarity may be detected in the four functions as they act as the key value-orientated functions of the business. They are: accessing money (Finance), allocating value (Commercial), selecting the value co-ordinators (HRM), and managing contracted deals (Procurement). (2) The second layer, more frequently of mixed provision, although with a few firms holding complete in-house capability, includes the functions of: Reservoir engineering, Petroleum engineering, and Seismic analysis. This capability layer is highly technically orientated, as firm capability lies in geological knowledge of petroleum/reservoir dynamics. (3) The final layer of capability, most frequently of mixed provision, includes the functions of: Project Management, Facilities Management, and Health Safety/Environment. The main capability of this layer pertains to the monitoring and control of action, the ability to oversee the drilling or production work being undertaken.

These three layers of capability, are the Independents' sites of specialization, within each layer activities are *similar* and *complementary*. *Similar*, in that they require the same capability for their undertaking, and *complementary*, because they represent different phases of the same process of production. According to Richardson's theory (1972), it is the similarity of the activities within each layer that has lead to their internalisation. Dissimilar activities would result in increased information costs and diseconomies of

scope. In contrast, similar activities, drawing upon the same existing firm capabilities, can be efficiently internalised (Foss, 1994, p.37).

6.2.2 Complementary Functions

Examination of the remaining functions, those primarily concerned with out-sourced provision (see Section 5.4.1.2), reveals their relationship with the above three capabilities is one of complementarity, rather than similarity. Each of the out-sourced activities fall into categories that require very specialised capabilities. For example, Drilling requires the running of highly sophisticated physical assets, namely drilling rigs which includes provision of the rig and the team of personnel required to work it. Likewise, the other categories of Engineering, Subsea Operations, and Infrastructure provision, also require highly specialised skills and equipment that go beyond the capabilities of the Independent[1]. The capabilities of the average Independent are more general in nature, they include: (1) value generation through deal making and managerial co-ordination (2) assessing petroleum/reservoir dynamics in order to locate and extract the petroleum (3) monitoring and controlling the execution of drilling/production work programmes[2]. It would seem the internal capability of Independents is strongly focused upon the core elements of the exploration and production business; those activities that rely on human capital, and the co-ordinating role of the entrepreneur. These are activities that set the direction of the firm. Indeed, Independents bear close resemblance in their structure to Mintzberg's (1989, p.112) *Entrepreneurial Organization*; emphasis is upon the co-ordinating Strategic Apex (Capability 1) and essential work, that undertaken by the Operating Core (Capabilities 2 & 3). Ancillary activities are kept to a minimum.

According to Richardson, it is with dissimilar yet complementary activities, where the possibilities for co-operative arrangement lie e.g. between Independent and contractor. As the next Section (6.2.3) demonstrates, Richardson's assertion is vindicated by certain

[1] Holding the appropriate capabilities, the 'skills, experience, and market connections' (Richardson, 1998, p.44), and benefiting from economies of scale, external contractors specialised in one of these activities will be more efficient in its provision than an Independent.

[2] The capabilities of Independents are principally grounded in Human, rather than Physical Capital.

Independent's relationships with Drillers and Facilities Management contractors. With each of these complementary activities, co-operative arrangements are detected.

Richardson's concept of co-operation is not conceived to be a fixed state. Rather, he identifies differing business associations lie along a spectrum of co-operative arrangements. He proposes that a 'continuum' exists that passes from transactions - as found in the commodity markets, where co-operation is minimal - to 'intermediate areas' where 'linkages of traditional connexion and goodwill' are present, and finally to clusters, groups, and alliances where co-operation is most fully developed (Richardson, 1972, p.229).

For the Independents, such an intermediate area of co-operation is recognised to reside among activities associated with capability categories (2) and (3). Of mixed, in-house and out-house provision, these activities often resulted in the internal and out-sourced teams working together. This was found to be particularly true of contractors (consultants) supporting the Independent's existing geological capability – specialized expert advice was occasionally contracted in. As Richardson (1972, p.236) documents, 'a subcontractor commonly compliments his own capabilities with assistance and advice from the firm he supplies.' Bringing in external geologic capability has an inherent element of co-operation. The contracted firm is advisory in its role; the business transaction is one of exchange, rather than commodity transfer. Although a fee is paid to the consultant, the information he/she divulges is not charged per unit, rather it is their presence, knowledge, and open advice that the firm requires – the transaction has a co-operative element. As Foss (1994) quotes, co-operation requires some knowledge of the other firms 'neighbouring' capabilities (Richardson, 1972, p.228) so that '...their limited individual fields of vision sufficiently overlap so that...the relevant information is communicated' (Hayek, 1945, p.86).

6.2.3 Alliances

Alliances, recognised by Richardson to be those arrangements where co-operation is most fully developed (Richardson, 1972, p.229), were infrequently used by Independents

in their relationships with contractors. Only a minority of Independents had engaged in alliances with drilling (3/14) and facilities management (2/14) contractors (Table 5.4.6). The most common reason given for the formation of an alliance was either because the firm lacked the necessary experience at the time, or, as in the case of Independent K, that the company's business model was intentionally not geared towards monitoring and implementing work programmes (see Section 5.4.2.1). Independent K's strengths resided mainly in capability layers (1) and (2), with layer (3) provided through alliances. For example, Independent K had established an office in Aberdeen where, its own staff together with the personnel of the facilities management contractor and a reservoir engineering / well design contractor were based, for the duration of the project. This level of co-operation was reported to be a product of the Independent's CEO having a long established working relationship with key individuals in the two contracting firms. Although overall few alliances were arranged by Independents, the example of Independent K, demonstrates that a strongly co-operative arrangement can be established[3]. Trust and 'goodwill' can mitigate the need for more 'formal arrangements' (Richardson, 1972, p.226).

6.2.4 Williamsonian Interpretation

Results for the functional sourcing questions (Table 5.4.1, Fig 5.4.1), may alternatively be interpreted utilising Oliver Williamson's variant of transaction cost economics, with his specific variables of asset specificity, uncertainty, and frequency of transaction. For three of the four primary functions (Commercial, Financial, and Procurement), human asset specificity and frequency of transaction appear the most likely rationale for internalisation. If used to represent the core of the business, these functions are highly dependent upon individual personnel. Deal making and skilled managerial co-ordination are talents likely to be tailored specifically to a particular Independent. The personnel enacting these functions, the senior management, cannot easily be replaced; their skills,

[3] Independent K was also one of the firms to report only utilising a simple day-rate with drilling contractors; the rationale, "contractors will factor in down-time."

knowledge and experience are firm specific[4]. Moreover, the frequency with which such personnel are likely to be utilised, strengthens the rationale for their internalisation. The internalisation of these functions matches what Williamson (1985, p.105) terms 'mundane integration'; the integration of core functions essential to the running of a business.

The predominant internalisation of the human resource management function might be a product of uncertainty. The increased responsibility that is reported to be conferred upon individuals working for Independents (Table 5.3.1 and Table 5.3.5) may invigorate the need for newly hired personnel to be compatible with existing staff. Determination of fit is most readily achieved when current staff are integral to the interview and selection process, for this should reduce uncertainty and attenuate adverse selection. Reservoir and Petroleum engineering, being mainly sourced in-house or of mixed provision, can be interpreted as a consequence of human asset specificity. Continuity of the employment of personnel in these functions is necessary if knowledge about a particular licence area is to be maintained over its life-time. Learning-by-doing (Arrow, 1962) results in pertinent knowledge and experience being stored with individuals in the company. It is their familiarity with licences which enables comparisons to be drawn so that the appropriate licences may be selected or disposed. Moreover, in-house geological capability is essential if a store of knowledge about long-term licences is to be maintained. An outsourced solution could run an availability risk, access to a particular consultant on a regular basis may not be guaranteed. Thus the frequency with which these functions are utilised provides a further practical reason for internalisation.

The high internal/mixed provision of HSE could be interpreted as a consequence of the frequency of transaction. Any operated exploration or production licences upon which the firm takes action, will require health, safety and environmental checks and procedures to be undertaken. The required level of provision will, however, depend partly on the

[4] For example, review of Independents' annual reports reveals that should a Director wish to terminate his employment with a firm, then one year's notice is typically required. This accords with Williamson's (1985, p.243) reasoning that 'governance structures must be crafted more carefully as the degree of human asset specificity increases.'

state jurisdiction to which the operated licences pertain. For example, some states are likely to be more rigorous in their health and safety requirements than others. In this context one notes that the only two British Independents (E & G) fully outsourcing the HSE function, were also both engaged in the same Post-Soviet country.

Both data management and seismic analysis are also of mainly in-house or mixed provision. It could be argued that the primary reason for this was uncertainty. Contracted firms that deal with the same competitors in a particular region may be placed in a privileged position where confidentiality could become an issue (Cameron et al, 2000, p.241)[5]. To reduce this uncertainty, a level of in-house provision is typically present. For seismic analysis, a degree of human asset specificity is also likely to be important; many Independents may be reliant upon the internal expertise of their seismic interpretation personnel.

Finally, turning to the last two functions of predominantly mixed provision, viz. project and facilities management, the partial nature of their internalisation could be interpreted as arising from uncertainty and human asset specificity. Internalisation confers upon Independents a greater knowledge of these functions. Thus, when external contractors are utilised, the Independent is potentially better equipped to monitor and assess them, thereby reducing uncertainty. Beyond the monitoring role, experienced personnel also enhance the internal capability of the firm; they act as the first resources necessary to develop full in-house capability.

For the remaining functions (see Section 5.4.1.2), mainly outsourced in their provision, not one of the factors of asset specificity, uncertainty, or frequency of transaction is sufficient for internalisation to be undertaken. Nevertheless, though of insufficient magnitude, these factors are still present. For example, on reviewing the outsourced functions of drilling equipment and personnel, it is clear that both dedicated asset specificity and uncertainty are present. An Independent will arrange for a drilling rig to

[5] Privy to the licence interests of their competing customers, such contractors would hold highly sensitive information, for example, new geological play ideas.

be kitted-out with the appropriate modules and machinery specific to their requirements. Thus the rig holds a degree of dedicated asset specificity[6]. Turning to the drilling personnel, there may be uncertainty concerning the 'effort' (Kemp and Stephen, 1999) and competence of the contractor in executing the task. Drilling, although not internalised, is a function of great importance to the performance of Independents (see Section 5.4.2). As a consequence, following Williamson's reasoning, safeguarding governance structures must be present between Independents and drillers if credible contracting is to be realised. Section 6.2.8 reviews this concept in light of Richardson's co-operative alternative.

6.2.5 Size of Firm and Internalisation of Functions

As Independents grow in size, and the quantity of exploration and production licences increases, Williamson (1985, p.94) would propose that the diseconomies associated with in-house production will be 'everywhere reduced'. Thus he says that, 'The firm is simply better able to realize economies of scale as its own requirements become larger in relation to the size of the market' (Williamson, 1985, p.94). Williamson's chart of comparative production and governance costs assists his explanation (Fig 6.2.1). On the horizontal axis is the level of asset specificity; on the vertical axis is the cost per unit.

Comparative Production and Governance Costs

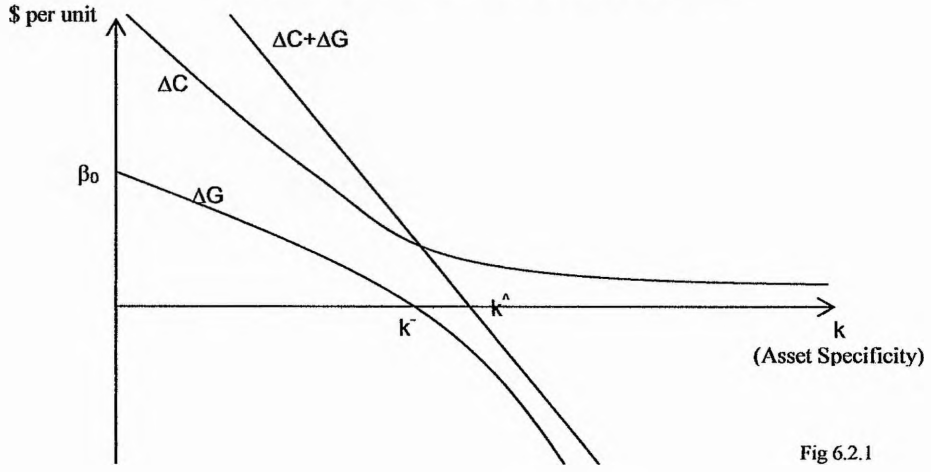


Fig 6.2.1

[6] Sunk costs are also present for the Independent will have spent valuable labour time in selecting this firm through their tendering process.

ΔC is given as the steady state production cost difference between producing internally the given function and the steady state cost of procuring the same function in the market. ΔC is expressed as a function of asset specificity (k). It is assumed that ΔC will be positive throughout, but will be a decreasing function of k. For standardised transactions, where market aggregation economies are great, the production cost penalty for using internal organization is large; where ΔC is large, k is low. As functions become close to unique, high values of k, aggregation economies of outside contracting are no longer realized. The previous contractor's economies of scale and scope are no longer applicable for the Independent can internalise without penalty.

ΔG is the comparative governance cost between market and internal organization. At low asset specificity levels, markets can aggregate demands, economies of scale and scope are realized and advantage is conferred. However, when asset specificity is great, high bilateral dependency upon a particular contractor enhances the benefit of internalisation, where greater control over the specific function is established. The point on ΔG where the choice between firm and market becomes 'one of indifference', is denoted by k^{-}.

With the aim being to minimize the sum of production and governance cost differences, the vertical sum of $\Delta G + \Delta C$ is also displayed. The value of k for which this sum becomes negative is denoted by $k^{\wedge}$. Williamson proposes, that where optimal asset specificity is slight ($k^{*} << k^{\wedge}$), out-sourcing holds advantages in both governance and scale economy respects. However, when optimal asset specificity is substantial ($k^{*} >> k^{\wedge}$), aggregate economy benefits are minimal and internal control is necessitated. For intermediate degrees of optimal asset specificity, mixed governance, in which some firms will outsource, whilst others will internalise, is thought likely to arise.

Application of this Williamson analysis to increasing firm size, predicts that larger firms will integrate more functions than will small, ceteris paribus. Better able to realize economies of scale the ΔC curve for the larger firm falls everywhere as quantity increases. Thus, the vertical sum of $\Delta G + \Delta C$ intersects the axis at a value of k^{-}, that

progressively moves to the left as the quantity to be supplied increases. Analysis of findings shows Independent firm size, measured by Market Capitalisation, to be positively associated with the Total Number of Licences Held (Spearman's rho correlation coefficient = 0.549; Prob. value = 0.022). In essence, the larger the Independent, the greater the volume of work in which it is involved. According to Williamson's theory, Independents of larger size should internalise more functions than smaller Independents. Requiring a greater quantity of the out-sourced function than a smaller firm would, economies of scale shift k^- to the left and internal provision is facilitated. Indeed, our results support this finding (Section 5.4.1.3). Examination of Table 5.4.1 for the functions of seismic analysis, petroleum engineering, development engineering, and software engineering reveals the smaller Independents (A to H) to show lower levels of internalisation relative to larger Independents (I to N). For example, for the function of seismic analysis, only 62% (5/8) of the smaller Independents have in-house capability, whereas 100% (6/6) of the larger Independents do. Williamson's theory may also explain the higher propensity for internalisation of functions among the North American Independents (Table 5.4.3), relative to the British firms. The North American Independent firm size is on average significantly larger than the equivalent British Independent (Section 5.2).

6.2.6 Reconciling the Two Theories

Williamson's transaction cost approach presents an inviting system for analysis. However, it does not completely resolve the question as to why firms may move to source some functions completely in-house, before other functions, despite each function holding a similar level of asset specificity. The answer may be formulated through integration of a Penrosian (1959) resource-based interpretation, with a Williamsonian schema. Williamson's (2002) comparative costs of governance chart, which displayed the transaction cost consequences of organizing transactions in markets (M) and hierarchies (H) as a function of asset specificity, can be modified to incorporate a Penrosian element. Hierarchies (firms) are composed of a range of functions that may be sourced in, or out-house. The point at which internalisation of a particular function into a hierarchy is shown to be preferred, will vary according to function. For functions that are

most similar to the existing capabilities of the firm S(k), at a relatively low level of asset specificity (k_a), comparative costs are such that it is already preferential to fully integrate the function (Fig 6.2.2). As asset specificity builds up, beyond intersect 'a', the transaction cost of organizing the transaction in the market M(k) exceeds the cost of internalising it S(k). In contrast, for functions that are less similar to the existing capabilities of the firm C(k), only at a higher level of asset specificity (k_b), do comparative costs advocate internalisation. The theory developed is that firms can fully internalise certain functions at lower levels of asset specificity, provided those functions are of greater proximity to existing capabilities. The rationale to this action is because proximity confers integrating advantages, being similar to existing functions, managerial resources are already attuned to the co-ordinating techniques required. Pursuit of firm growth along channels of similarity means these proximate functions can be integrated more quickly and efficiently than those of greater distance. The result: functions of proximity to existing firm capabilities may be more easily integrated.

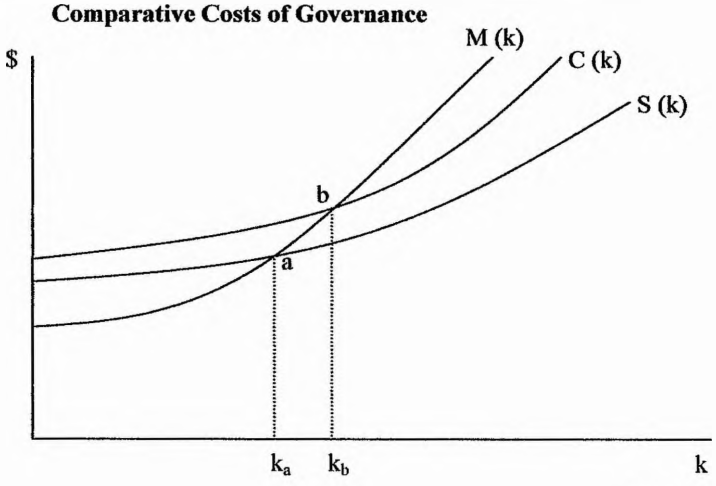


Fig 6.2.2

Closer examination of Williamson's work (1985, p.96) reveals that he acknowledges asset specificity is relational, and that uniqueness is partially formulated with respect to the availability and efficiency of out-house contractors (market provision). Williamson also reasons that internal organisation influences the point of internalisation; he states the move from the U to M-form organisation, reduces ΔG, thereby shifting $\Delta G + \Delta C$ to the left – encouraging integration at a lower level of asset specificity. Since the transaction cost theory incorporates the idea that internal organisation can influence the

decision to integrate, it may also be reasoned that the level of similarity displayed by a particular function to the firm's existing capabilities will influence which functions are integrated. Ceteris paribus, those functions of greater similarity to the firm's existing capabilities will be integrated before those of lesser similarity.

Although the gathering of evidence to support the above theory is beyond the time-constraints of this research, it is advocated as a future line of inquiry for resolving the differences between the resource-based and transaction cost theories. If the type of functions internalised over-time are to be monitored, and their similarity to existing capabilities tested, a series of annual meetings with the same Independents will be required.

6.2.7 Availability of Contractors

The rationale for mixed provision is said by Williamson (1985) to lie in the property of varied asset specificity. In different geographic regions, for example, the ability to procure a component in the market will vary, this variation means the optimum level of asset specificity (k) in the two cases will not be identical. For locations where the market does not permit sufficient procurement opportunities, (e.g. where there are few contractors available or of a necessary standard) then the optimum level of k (when compared to locations where ample contractors are available) is reduced. With limited equivalent contracted resources available on the market, those developed internally by the company are highly inimitable. The threshold level of asset specificity at which internalisation will occur, is set for Williamson, in a relational capacity, relative to market provision. This theory may be used to explain the significantly greater utilisation of contracted facilities management among those firms with the majority of their production within the UCKS (Prob. value = 0.038). The availability of facilities management firms, such as Petrofac, increases the optimum level of asset specificity stimulating internalisation, therefore encouraging outsourcing. In contrast, for firms operating in geographical regions, where market provision of facilities management contractors is less established, or absent, the optimum level of asset specificity for encouraging internalisation is much lower. The Independent must provide the functions

internally. For example, Independent C stated when undertaking operations in East Africa, many of the functions had to be provided in-house as the relevant contracting firms were not operating in that region.

6.2.8 Safeguarding Governance Structures

The most recent contractual schema developed by Willliamson (2002) outlines four contractual alternatives available to a firm (Fig 6.2.3). As in Williamson's traditional nomenclature, *k* is a measure of asset specificity. Whilst *s* denotes the magnitude of safeguarding governance structures, such as information disclosure, penalties, specialized dispute resolution and verification mechanisms. These safeguards act as measures to mitigate contract manipulation or opportunistic behaviour. For the condition where no safeguards are provided s=0, whilst where safeguards are implemented s>0.

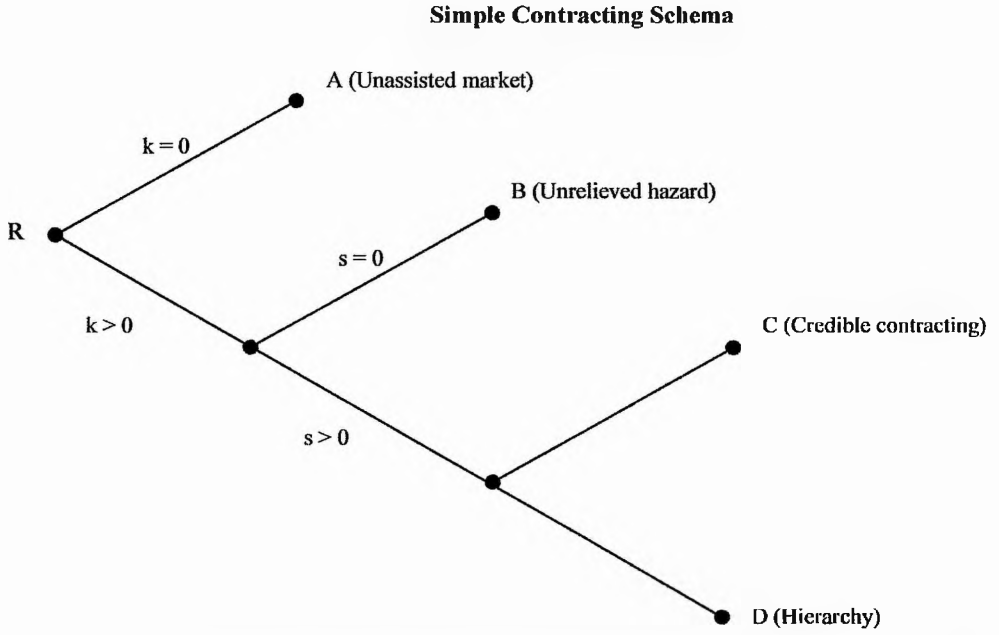


Fig 6.2.3

The above schema may be considered a form of Game Tree, it progresses from the root node 'R', through intermediate decision nodes, to terminal nodes A, B, C and D. Terminal Node A, characterises the ideal transaction where there is no dependency between buyer and seller, and governance is achieved through competitive market prices. In the case of disputes, judicial court procedures are the norm and appropriate damages

awarded. Terminal Node B, of 'unrelieved contractual hazards', is suggested by Williamson to be unsustainable. Specialized investments are exposed for which no safeguards are provided. Consequently, far sighted players are said to avoid such hazards. Thus the hybrid middle ground choice (Node C) for Williamson, where 'credible contracting' becomes possible, is that for which safeguards are provided. Finally, should asset specificity and added uncertainty continue to accrue, Williamson details the increased need for 'cooperative adaptation' will be provided by complete internalisation, the player will choose (Node D) to internalise the function within its 'hierarchy'.

For Williamson's theory founded on the tenet of opportunism, the likelihood of co-operation appears restricted to the realm of the unified firm. Safeguards are regarded as essential if credible contracting is to be achieved under conditions of asset specificity. Giving some support to this reasoning, results as discussed in Section 5.4.2.1, do confirm some safeguards to be operative in the contracts established between Independents and drilling contractors. Both information disclosure and verification mechanisms were specified to be very important governance structures (Table 5.4.5). However, the incentivisation safeguard received a heterogeneous reception; ≈40% of British Independents did not utilise an incentivisation system with their drilling contractors (Fig 5.4.2). These Independents noted a simple day-rate to be adequate. Opportunism of the kind Williamson discusses does not appear to be apparent in the relations with drilling contractors as experienced by some Independents. This result accords with existing criticism that has been directed towards Williamson's treatment of opportunism (Kay, 1993; Casadesus-Masanell and Spulber, 2000). Kay (1993) rightly reasons that opportunism does not hold resolute application to all societies. Comparing Japan to the US, he recognises that group harmony rather than individualistic self-interest is more characteristic of Japanese economic behaviour. The suggestion is made that obedience is a more reasonable behavioural building block than would be opportunism for this society. Further criticism, stimulated by the re-assessment of General Motor's acquisition of Fisher Body draws the conclusion that co-operation, not opportunism, characterised the relationship between the two firms (Coase, 2000; Freeland, 2000;

Casadesus-Masanell and Spulber, 2000). The overturning of this, once classic case of opportunism, and the recognition of the 'amicable nature of contractual relations between the two companies' (Casadesus-Masanell and Spulber, 2000, p.77), highlights the contemporary potential that Richardson's (1972, p.228) co-operative, safeguard free[7], middle-ground may now receive. Co-operation, without safeguards, would suggest the importance of trust, 'goodwill and reputation' (Richardson, 1972, p.229) to commercial exchange. Two of the Independents (E & H) that did not incorporate incentivisation, stated "personal trust" and the development of a business "relationship" as a key reason for their firm's association with the drilling contractor with whom they held the strongest ties. This resolutely contrasts with Williamson who maintains that in the absence of 'credible commitments', 'trust is irrelevant to commercial exchange' (Williamson, 1993, p.469). On the issue of opportunism versus trust, safeguards versus co-operation, the two theories are clearly divided.

6.2.9 The Safeguard of Incentivisation

For those Independents that did incorporate incentives, budget and time-targeted bonus systems were the most common incentives, followed by a turnkey solution. With the drilling contractors reporting the Independents' preference for turnkey to be a consequence of their desire to cap financial exposure and have a degree of certainty over the funds required, further emphasises the cost-control orientation of the Independent firm. Turnkey did not appear to be the consequence of opportunism by the drilling contractors, rather it was an internal motivation of Independents: knowledge of future costs would likely assist access to finance. Utilisation of a turnkey approach was reported to be more common among Independents than for Majors. Comparison of results for the British and North American Independent samples, reveals turnkey methods to be more common among the North American firms, 42% reported usage. These results correspond to the comments made by drilling contractor interviewees, who reported turnkey methods to be frequently used in the Gulf of Mexico. The perspective gained from these interviewees suggested that as more Independents enter the UKCS, and especially North American Independents, the demand for turnkey solutions was

[7] Or as Richardson (1972, p.228) terms 'no formal assurance'.

likely to increase. The majority of drilling contractors also reported Independents as shifting a greater proportion of risk to the contractor; the mode of causation was frequently referenced as the utilisation of turnkey. With a fixed price arranged to cover the entire work programme, under a turnkey system the cost of delays and over-runs would be borne by the contractor. This additional risk was not negatively received, some respondents detailed this aspect to be a strength of undertaking contracts with Independents. Beyond the higher return that could be earned from the additional risk, drillers also reported the greater contractor involvement and acceptance of existing contractor specifications to be further strengths of undertaking work for Independents. This finding contrasts with previous research on fixed price at outset / turnkey incentivisation. Ibbs et al. (1986), in quantifying the impact of different contractual clauses on performance of 36 building construction projects, reported that turnkey systems encourage a more adversarial relationship, than a simple day-rate system, because risk allocation is mainly on the contractor (see Table 6.2.1). Drilling respondents did not report this aspect for operations with Independents. The majority of Drillers viewed working relationships with Independents positively. For example, Contractor B, which was dedicated to the use of turnkey, remarked that it was "easier to work for Independents". Other contractors found the "greater autonomy" (Contractor A) and "contractor involvement" (Contractor D) to be further positive features of working for Independents. Indeed, Contractor D stated such autonomy led to enhanced work 'satisfaction'.

Comparing Fixed Price with Cost Plus Contracts in Construction		
	Fixed Price	*Day-Rate*
Risk allocation rests mainly with	Contractor	Buyer
Incentives for quality	Less	More
Flexibility for change	Less	More
Adversarial relationship	More	Less
Source: Ibbs et al. (1986) Referenced in Bajari and Tadelis (2001).		

Table 6.2.1

Penalty systems, although rightly considered in terms of their possible practicality by Kemp and Stephen (1997; 1999), were found by this research to be rarely utilised. Penalties were only implemented with respect to rig arrival, they were not incorporated for drilling / production in process. Once the contractor commenced work, penalty systems were usually absent.

Summarising the above results it is clear that not all of Williamson's safeguards are required for credible contracting to be enacted. Closer examination of the incentivisation safeguard reveals that its incorporation does vary. Part of this variation is because an alternate co-operative middle ground can be sought without the presence of incentives. Opportunism considered by Williamson to be a generic feature influencing the structure of all contracts should not be universally assumed; the players of certain countries appear more prone to opportunism in business relations than others. I would reason Williamson's concept of opportunism is one tailored to the US context, a country where, the written contract (Kennedy, 1985) and its legal stature, holds primacy. Steeped in legal interpretation – citing John R. Commons – Williamson's opportunism leaves no space for Richardson's co-operative middle-ground. The frequency of incentives utilised amongst the North American Independents, may reflect the regional applicability of Williamson's opportunism, however, for the British Independents a co-operative arrangement is clearly often present.

6.3 NEGOTIATION

6.3.1 Approach Factors

Analysis of the *approach factor* results demonstrates a strong variation in the ranking of factors for Non-Western (Fig 5.5.1) as compared to Western (Fig 5.5.2) contexts. Differing *approach factors* are clearly required for the differing contexts. The most noticeable discordant factor is *Accessing the appropriate government official.* Ranked first for Non-Western countries, it is placed fourth for Western. Current findings are supported by Salacuse's (2003) assertion that accessing the appropriate department and government official is a necessity for successful negotiation. The significance of the '*Access*' factor is found to be higher in the Non-Western relative to Western context. This *context differential* may be partly explained through examining the writing of Ye (2003). Building upon the work of Wilson (1989), who identified the heterogeneity with which the work of government agencies actually gets defined, Ye (2003, p.4) notes that the rules and regulations among Non-Western countries are often ambiguous. In such situations, bureaucrats become the first to define the rules before they implement them. Consequently, their personal attitudes and beliefs, political ties, as well as other personal considerations, determine the definition of rules. Rather than the objective bureaucratic system as a whole determining action, authority often lies with a particular government official (Ye, 2003, p.4). In such circumstances, Salacuse's (2003) concern with access is particularly magnified. For Western countries, where the overall bureaucratic system, rather than individual bureaucrat, mainly determines action (Ye, 2003, p.3); *Persistence*, not *Access*, is the fundamental behavioural approach required. As Jun (2000) notes, many Non-Western developing countries look to Western countries as they work to modernize the public institutions in their own countries. The increased consistency of rules (Dimitrov, 2003), and formalization, characteristic of Western bureaucracies, diminishes the importance of *Access*. An observation to be further developed (Section 6.3.3) is that the Western context appears to approximate more closely Max Weber's 'ideal type' bureaucracy than the Non-Western context. As is discussed in Sections 6.3.4 and 6.3.5, such a difference may hold implications for the context within which Independents' negotiating strengths are most applicable.

In both contexts, the proposed Independents' strength (Section 1.4) of greatest significance for the ranking questions was the *Seniority of company personnel.* Within negotiation literature (Kapoor et al, 1991), this factor is noted for its ability to hasten the negotiating process, and to facilitate access to senior personnel within the host government (Marsh, 2001). Utilisation of senior personnel, with the authority to commit, may negate the temptation of firms to engage in the 'limited authority' / 'escalating authority' ploys described by Kennedy (1998a). 'Limited authority' is when a negotiator claims their authority to vary a deal is strictly limited. 'Escalating authority', occurs where the deal is continually referred to the next most senior person in the organization for endorsement. As Kennedy reasons, the utilisation of ploys is insufficient for 'longish negotiation', as over several meetings the ploy is likely to be detected. Firms which traditionally send their most senior personnel with the authority to commit to negotiating meetings, from the perspective of these two ploys, are likely to be more decisive in their bargaining approach. Comparing the two contexts, seniority of company representatives was ranked more highly in Western countries. However, this is partly the consequence of the *Accessing the appropriate government official* factor being of substantially lower rank. The other proposed Independent strength, *Use of the same company representatives*, was found to be of lesser significance, relative *to Seniority of personnel*, in both Western and Non-Western contexts. Overall, neither of the proposed Independents' strengths were shown to be the most important *approach factor* influencing award of licence in either Western or Non-Western contexts. Although both factors are noted as approach strengths, particular to Independents, other approach factors of general applicability to all sizes of firm, such as *Accessing the appropriate government official* and *Persistence*, are reported to be of greater influence in Non-Western and Western contexts respectively.

6.3.2 Content Factors (Technical)

Level of commitment to drill is the most important *content factor* influencing the award of licence in both Western and Non-Western contexts (Fig 5.5.5-6). As Van Meurs (1971) recounts, most governments welcome exploration and production investment. The UK DTI (2003) openly acknowledges that it attaches greater importance to a 'firm'

commitment to drill, than to a 'contingent' commitment. Results show all governments (Fig 5.5.5-6), Western and Non-Western, rank *Commitment to drill* above all other technical content factors. Governments seek and support activity, for activity equates to investment (Hann, 1986). From the list of typical government objectives, detailed in Table 6.3.1, *Commitment to drill* would likely result in increased local employment opportunities and use of local contractors. Taking the example of the North Sea, drilling rigs require staff both offshore and onshore to co-ordinate drilling activities (BP, 1977). Moreover, should drilling prove successful, and oil is struck, then a further government objective of enhanced domestic petroleum supply is achieved. In contrast, a contingent commitment does not necessitate activity (Section 3.3.1). For example, should geotechnical evaluation prove unpromising, then drilling will not commence, and few of the government's objectives will be fulfilled.

Government Objectives
- A significant share of the revenues
- Employment for citizens
- Use of local contractors
- Training for citizens
- Transfer of technologies
- Adequate sovereignty / control over the project
- Augmentation of domestic sources of petroleum
Source: Kennel (2000)

Table 6.3.1

For the Western context, findings show *Geological assessment* to be of greater importance than *Financial capability*. The reverse is true of the Non-Western context, where *Financial capability* ranked higher than *Geological assessment*. The findings indicate a differential in the technical content priorities of each context (Fig 5.5.5-6). Although not explicitly identified, the cause of this variation, may lie in Non-Western governments' greater need for economic investment (O'Connor, 2000). Most developing countries are included in the Non-Western category.

6.3.3 Context Comparisons

Results show *approach factors* to be of overall greater influence in Non-Western countries relative to Western, whilst *content factors* are of greater influence in Western countries relative to Non-Western (Section 5.5.3.1). Combining an analysis of this result with the finding that selection procedures in Western countries are formally based, whilst

those in Non-Western countries are relationship based (Fig 5.5.8-9), demonstrates the two are typically dissimilar in their operation. Explanation of these results can be sought through examining the constituent features from which the government context is derived (Fig 3.3.2). The most influential feature pertains to that of the governments' predominating bureaucratic systems. Max Weber (1947) recognised the bureaucratic coordination of activities to be the distinctive mark of the modern era. He argued that bureaucracy, organised around formalized rules and procedures was an emerging institutional feature of the modernising West. Also, the prevalence of rational impersonal rules within the 'ideal' bureaucracy was associated with a high degree of administrative efficiency. The 'ideal' bureaucracy, in Weber's sense is free of unstructured decision-making. Calculated, rules-based rationality is the primary order. Application of Weber's 'ideal' bureaucracy to the government context in which petroleum licences are issued would, in theory, reduce the significance of *approach factors* to limited importance, whilst selection procedures would be entirely formally, rather than relationship, based. The decision of an 'ideal' bureaucracy would not be mediated by the particular approach methods adopted by a firm. Instead, a set of procedures would be institutionalised. Similarly, being wholly depersonalised in operation, an 'ideal' bureaucracy would be completely formal in its approach. Neither Western nor Non-Western contexts were found to fit this ideal scenario (Table 5.5.7 and Fig 5.5.8-9). This result is supported by Weber (1947, p.301), who recognised that the 'ideal' bureaucracy does not occur in its pure form. However, analysis of our findings does reveal the Western context of government to be a closer approximation to Weber's 'ideal' bureaucracy than to the Non-Western context. Approach factors, theoretically absent in the 'ideal' bureaucracy, were found to be of greater influence in Non-Western countries (Fig 5.5.7). Similarly, *content factors*, theoretically of greater influence in an 'ideal' bureaucracy, are of greater influence in Western countries. Content factors, containing the substance of a company's proposal, would be the aspect to which an 'ideal' bureaucracy would strongly apply its strictly calculative rationality. Although this research assumes that in both Western and Non-Western contexts, *content factors* are of greater significance than *approach factors* in determining licence award, results show the two contexts to differ, in terms of the relative impact of each factor. Further evidence supporting the view that the Western

context approximates to the bureaucratic 'ideal', is advanced by the finding that licencing authorities'selection procedures were mainly formally based (Fig 5.5.8). This strongly contrasts with Non-Western countries, where the selection procedure is more relationship orientated.

Verification of this *context differential* may be noted in the writings of Peters (2001, p.168). He recognises that the formal structure of most bureaucracies in the Non-Western world, on the surface, does conform closely with Western administration. This, he attests, is partly a consequence of their colonial inheritance. Thus, compliance with certain formalities is necessary, if aid is to be received from developed nations and international organizations. However, Peters (2001, p.168) notes the actual operations of these Non-Western structures are quite different; 'non-bureaucratic criteria still tending to supersede the rules, procedures and hierarchy of the formal structure.' With the current results of this thesis having confirmed the distinction between Western and Non-Western contexts, focus now turns to the open questions which probed the strengths and weaknesses that smaller firm's size was reported to confer upon applications made in either context (Question 3.5, Appendix 1.2).

6.3.4 Non-Western Government Context

Analysis of results does suggest that Independents are in a stronger position when applying for exploration licences in Non-Western, as against Western countries (Section 5.5.3). As results to the open questions demonstrated (Section 5.5.3.2), all Independents recognised smaller firm size had conferred some advantage in the Non-Western context (Table 5.5.12). In contrast, for applications in Western countries, respondents often claimed no size advantage was conferred (Table 5.5.10). The greatest strengths reported for Independents making applications in the Non-Western context mostly related to *approach factors*, rather than *content factors* (Table 5.5.12). The principal *approach factors* given by respondents included: *Seniority of company representatives* and *Communication* (Section 5.5.3). Closer examination of both approach factors revealed respondents frequently referred to the ability of the smaller firm to establish relationships. The power of the personal relationship approach factor, although long

overlooked in negotiation research (Greenhalgh,1987), has received considerable attention in recent years (Sondak, et al, 1999; Halpern, 1994; Mannix and Neale, 1993; Polzer et al, 1993; Shah and Jehn, 1993; Sondak and Moore, 1993). Within negotiation research, what constitutes a relationship has been given various definitions (Greenhalgh and Chapman, 1998). However, a useful framework of conceptualisation is employed by Halpern (1994). Drawing from the work of Schank and Abelson (1977) and Fiske and Taylor (1991), Halpern posits a relationship to be a 'cognitive structure' also called a 'script', that mediates the way in which parties exchange information during a transaction. The 'relationship script' guides each party to an understanding of the set of behaviour expected of the other. This interpretation is close to that of Kennedy's (1998a) writings on the relative linkage between 'attitudes' (similar to scripts) and resultant negotiating 'behaviour'. The stronger a relationship, the more each party can cognitively anticipate the behaviour of the other party, and the greater the likelihood that the behaviour will be orientated towards maintaining the relationship into the future (Halpern, 1994).

The presence of a strong relationship is associated with joint negotiating gain (Greenhalgh and Chapman, 1998). Based on data from 117 negotiating dyads and using 'seemingly unrelated regression' (Pindyck and Rubinfeld, 1981, p.323) to improve precision, Greenhalgh and Chapman (1998) found all of the regression coefficients between variables to follow the hypothesised directions. The directional linkage between each of the variables tested by Greenhalgh and Chapman (1998) are displayed below (Fig 6.3.1). In this figure, only those coefficients which are significant at a Prob. value of less than 0.05 are detailed.

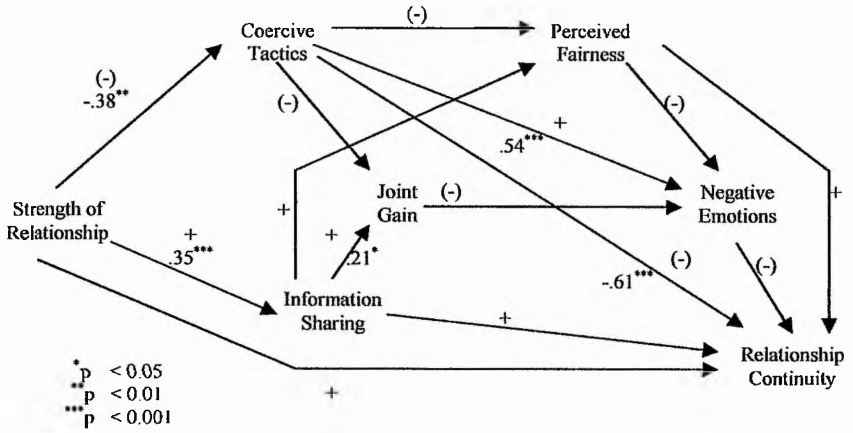


Fig 6.3.1

A strong relationship influences the behavioural actions of both parties. Halpern (1994), focusing upon the relationship script of friendship, found people to anticipate bargaining more intensely, by trying harder to get their price with strangers, rather than with friends. This supports the findings of Greenhalgh and Chapman (1998), where weak relationship was associated with coercive behaviour, and coercive behaviour negatively associated with joint gain (Fig 6.3.1). Behavioural actions displayed by parties to a negotiation may be considered as situated on a continuum between coercive (red) behaviour and passive (blue) behaviour (Kennedy, 1998a). Red behaviour is enacted when the relationship is weak, one party regarding the other as an 'opponent'. Blue behaviour is played when a party considers more will be gained through co-operation. The two behaviours are equivalent to those in the classic prisoner's dilemma[1]. Red action approximates a player defecting by confessing: blue action approximates the move to not confess. Should either or both of the players undertake a red strategy, and confess, joint gain is impossible (Kennedy, 1998a). Following the prisoner's dilemma schema, the only outcome stimulating joint gain would be when both players follow a blue behaviour, the 'win-win' outcome (Kennedy, 1998a). In practice, the co-operative scenario is rare: 'negotiators defect' (Kennedy, 1998a). As Nash (1951) would reason for the prisoner's dilemma, the game equilibrium is a non-co-operative outcome, both players confess[2].

The polar extremes of red-blue do not map directly onto action. Behaviour exhibited is likely to be positioned somewhere on the continuum between the two. The results of this study suggest several Independents were more closely allied towards a blue behavioural orientation. Emphasis is placed upon their "personal approach", the establishment of "relationships" and greater flexibility in deal structuring. Historically, greater deal

[1] The prisoner's dilemma considers the situation of two prisoners who each face the decision of whether to confess or deny a crime that they committed together. Each prisoner must make their decision without knowing what the other will say; there is no communication between them. If neither prisoner confesses then they are both held for 1month only. However, if one prisoner confesses, then he would go free, and the other prisoner would receive 6 months in prison. If both prisoners confess then they each receive 3 months in prison.

[2] In opposition to von Neumann and Morgenstern's (1944) co-operative plays / coalitional games, Nash (1951) argued all co-operative games could be interpreted through a non-cooperative framework.

flexibility has been reported for Independents (Sampson, 1975; Vernon, 1976)[3]. The blue orientation of Independents does not infer a pure 'giving' (blue), rather than 'taking' (red) strategy. As Kennedy (1998a) argues, joint gain is feasible without both players conducting passive, pure blue action. The solution is for a trading negotiating tactic to be adopted. Kennedy refers to this as his purple principle of conditionality. It incorporates both give (blue) and take (red) behaviours. A simple, yet effective trading methodology to negotiation is conceived: "If you give me X, then I will offer you Y." This concept should not be confused with our *approach factors*. The above conditionality principle relates to the final stage of the face-to-face bargaining mechanics of negotiation. It presents a fortuitous technique that is universal in its application. Complementary to this are *approach factors*. Varying according to context, the importance of *approach* precedes the use of the above conditional negotiating technique. Approaches channel a firm's efforts so that they may be in an advantageous position to proceed with the final bargaining stage. As has been previously discussed, *approach factors* are of greater influence in Non-Western, compared to Western contexts. In establishing relationships, the strength of Independents as an *approach factor*, appears to fit with the relationship emphasis of Non-Western selection procedures[4] (Fig 5.5.9). Three of the four principal strengths that smaller firm size conferred in Non-Western contexts, were *approach factors* (Table 5.5.12). Independents' strength in *approach factors* may positively assist successful licence award in Non-Western countries. This strength may be a further stimulus to Independents mainly holding Operated licences in Non-Western countries, and Non-Operated licences in Western countries (Table 5.6.6).

Why relationship strength was particular to small, rather than large petroleum companies was not explicitly tested by this research. Nevertheless, from current findings (Section 5.5), the following influences may be theorised. Firstly, that the use of senior personnel,

[3] Aminoil's unprecedented $7.5m down-payment for a Kuwati concession and Getty Oil's $9.5m down-payment for a Saudia Arabian concession in the late 1940s. The result proved that smaller companies 'offering far better terms than the majors, could still make large profits' (Sampson, 1975, p.143).

[4] The CEO of Independent α, reported the strength of relationship established with officials in the Iraqi Petroleum Directorate, to be of strong benefit. The example was given of Independent α staff being granted rapid access to see an oil minister, before that of a Major, Total representative – our 'α' staff were "rushed in".

with decision-making authority, increases the clarity of response and decision speed. Authority to commit may enable on-the-spot rapid decisions/offers to be taken, because fewer authorising personnel are necessitated for a decision to be made. Openness, alias information sharing, was significantly associated with joint gain ($p < 0.05$) (Greenhalgh and Chapman,1998) (Fig 7.3.1); authority to commit should enable such clarity to be enacted (Kapoor et al, 1991). Secondly, the Independents' senior personnel may be adept at cultivating relationships. This ability is unlikely to be an innate characteristic of the personnel themselves, rather one which has developed as a consequence of the business environment they experience. As Wickham (2001) reports for similar small sized entrepreneurial firms, customers, suppliers, employees and investors will all be drawn to the venture as a consequence of the 'positive relationship' they develop with the entrepreneur. Senior personnel in small firms are often strong in managing relationships (Exhibit 5.6.1), and it is this aspect that may also influence their reported strength in relationship establishment within the less formalized (Fig 5.5.9), Non-Western context. Strong relationships are a form of social capital (Bourdieu and Wacquant, 1992), considered to facilitate both the founding and later success of small firms (Westlund and Bolton, 2003).

Similar to results for the previous content ranking test, *Financial capability* was the most significant weakness of Independents applying for exploration licences in Non-Western countries. The Non-Western need for investment (O'Connor, 2000), was reported. The government objectives of 'Training for local citizens' and 'Transfer of technology', identified by Kennel (2000), were both referenced as features that Independents could rarely contribute (Table 5.5.13). As Independents D and I revealed, small petroleum companies are usually reliant upon the ability to hire local staff with existing experience. Independents would not undertake the training function so often sought by host governments (Kennel, 2000). Beyond investment, attention was focused upon an Independents' abilities to deliver. Lacking the recognition of larger firms, Non-Western governments were concerned as to whether Independents could deliver. Overall, the majority of weaknesses reported concerned mainly content rather than approach factors.

6.3.5 Western Government Context

Unlike the Non-Western context, most Independents reported smaller firm size to confer no advantage when applying for exploration licences in Western countries (Table 5.5.10). Only one approach factor, *Decision-making speed* was detailed as a particular strength that worked to the Independents' advantage. In the Western context, approximating more closely to the formalized 'ideal' bureaucracy, alternate 'personalised' approach factors, such as *Relationship establishment*, are less significant. *Financial capability* was given as the principal source of weakness that hindered Independents from being granted licences. The risk as to whether a company could "come up with the money" and fulfil stated commitments was specified as the principal concern of Western governments (Independent O). Similar to the financially intensive field development action, justification for Western governments' concern over exploration licences may also be sourced in Calomiris and Hubbard's (1990) work on 'credit rationing'. Credit scarcity limits the number of firms with whom investment may be placed. The smaller the net worth of a firm the greater the collateral restriction – size of firm influences the credit apportioned by the lender (Calomiris and Hubbard,1990). Given supply restrictions, Independents may have difficulty in raising the necessary finance. Evidence of adequate financial provision being a primary condition of licence award assists in explaining why management capability in arranging finance remains a wholly internalised function of the Independent firm - regardless of size (Table 5.4.3-4).

Overall, results suggest Independents are in a stronger position when applying for exploration licences in Non-Western, as against Western countries. The stimulus to this differential is a consequence of the fit between Independents' strengths in particular negotiating *approach factors* and the Non-Western context. Interviewees expressed that the ability of Independents to establish relationships with host government officials were a key aspect of their strength. This approach factor fits with the 'non-ideal' bureaucratic functioning of the Non-Western context, where a relationship-based, rather than a formal mode of selection procedure was followed. Although it is an assumption of this research that *content factors* are of ultimate significance in determining licence award in both Western and Non-Western contexts, the reported Independents' strengths in the *approach*

factors of, *Decision-making speed*, *Authority to commit / Seniority of personnel*, and *Establishment of relationships*, may confer a degree of comparative advantage when applying for licences in Non-Western countries. This advantage could be one of the causal influences that has resulted in Independents mainly holding Operated licences in Non-Western countries, and Non-Operated licences in Western countries (Table 5.6.6).

6.4 INTERNATIONAL STRATEGY

6.4.1 Why Internationalise?

Analysis of results (Section 5.4.1), reveals that the *primary rationale* for the Independents' first expansion overseas was relatively heterogeneous. Indeed, seven differing categories of *rationale* were specified. Nevertheless, the modal category, given as the *primary rationale* by 40% of respondents was the *Greater potential of oil/gas areas abroad.* Each of the companies specifying this rationale was found to have made its first move abroad into countries such as Russia, Romania, Tanzania, and Papua New Guinea. These match O'Connor's (2000) 'non-traditional petroleum countries' definition (see Section 3.4). Similar to Maponga and Maxwell's (2000, p.208) conclusions for the internationalisation of 'Junior'[1] Australian mineral companies, where 'virgin'[2] countries were targeted first, several British Independents likewise first targeted 'non-traditional', under-explored overseas areas. The perceived exploration potential of foreign countries most frequently stimulated Independents to initiate a move abroad.

Beyond this *primary rationale*, the factor noted by 60% of Independents (6/10) to be a complementary element influencing the overall decision to undertake activities in a second country (Fig 5.6.1), was the desire to *Diversify the portfolio.* Understanding why this factor was so often referenced may be explained by examining Markowitz's (1970) theory of portfolio diversification. In analysing the process of portfolio selection, Markowitz focused attention upon the importance of covariance; the property of two events varying concomitantly. Markowitz found that the most efficient composite effect of risk and return is achieved by combining assets whose yields are not positively correlated. The ideal portfolio consists of assets whose yields are inversely correlated. Within the petroleum industry (Section 3.4), the balancing of differing risk categories within a portfolio is recommended (Bauquis, 2000; Foss, 2000). This recommendation may be interpreted as founded on the principles that Markowitz determined. To

[1] Similar to the distinction made between 'Majors' and 'Independents' within the petroleum industry, for the mining industry the equivalent terminology is that of 'Seniors' and 'Juniors'.

[2] Akin to O'Connor's (2000) non-traditional petroleum countries, Maponga and Maxwell's (2000, p.208) 'virgin countries' are those 'geologically prospective regions with more friendly operating environments than one or two decades ago'.

demonstrate how diversification can reduce risk for a given return, Barry (1993) usefully applies Markowitz's theory to a simple two-prospect, petroleum licence portfolio. The results generated demonstrate the importance of managing covariance within any portfolio of licences. An adapted version of Barry's (1993) two-prospect scenario is related below.

An Independent exploration company is considering two licence prospects, A and B. Interpretation of seismic data reveals each prospect to hold differing probability density functions (Fig 6.4.1-2). Prospect A has a dry-hole probability of 60%, whilst riskier prospect B, has a dry-hole probability of 70%. Nevertheless, both prospects have the same expected monetary value (Table 6.4.1). The Independent has the choice of whether to invest solely in one of the prospects, or apportion its investment between them.

Two Prospect Portfolio – Calculating the Expected Value				
Prospect	Probability of Success	Mean Value (MMBOE)	Expected Value (EV) = Probability of Success * Mean Value (MMBOE)	σ Standard Deviation about the Mean Value
A	0.6	50	30	30
B	0.3	100	30	50

Table 6.4.1

Beyond Prospects A and B's differing probabilities of a successful find, the possible ultimate reserve size of a find is found to vary for each prospect. Prospect A has a smaller range of possible reserves (σ = 30 MMBOE) (Fig 6.4.1) relative to Prospect B (σ = 50 MMBOE) (Fig 6.4.2).

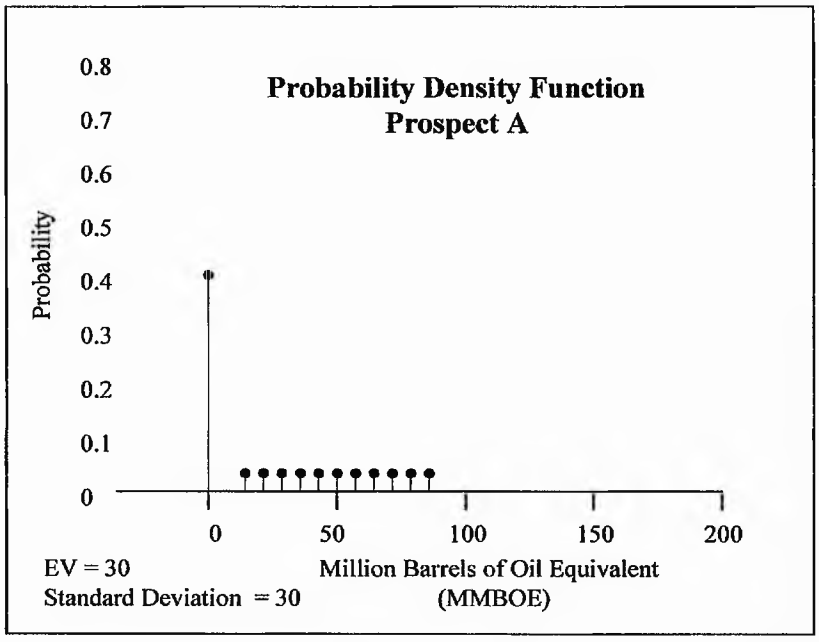


Fig 6.4.1

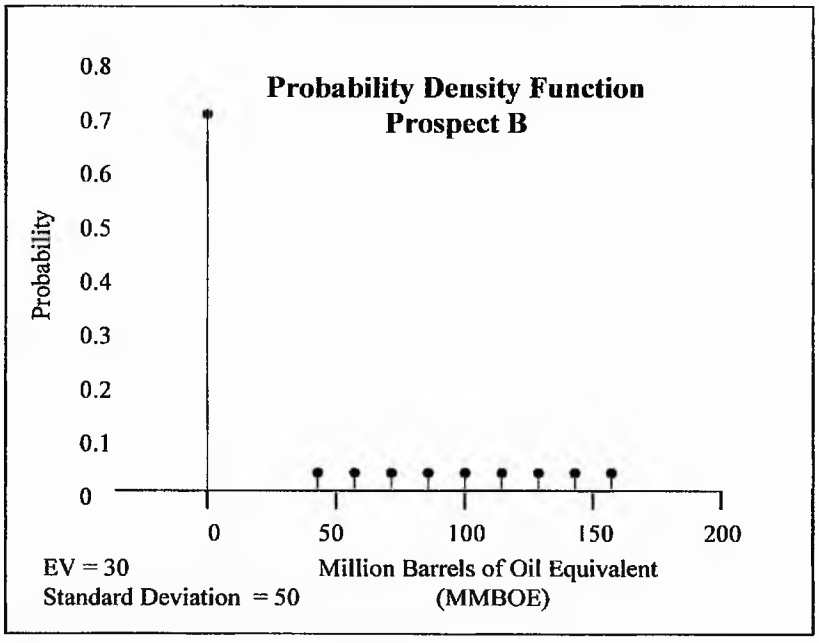


Fig 6.4.2

Assumed to be risk averse, the Independent must choose the best course of action to minimise the risk of deviation from the *expected value* of 30 MMBOE that the Independent seeks. For this to be achieved, the combined σ of Prospect A and Prospect

B should be minimised[3]. Summing a 50/50 mix of Prospect A and Prospect B, an expected value of 30 MMBOE is derived (Table 7.1.2). However, whilst the two Prospects' *expected values* may be summed, their *standard deviations* cannot. Instead the *variances*, the squared standard deviations (σ^2), must be added together with the covariances:

Variance of $A + B$ = Variance of A + Variance of $B + 2 \times$ covariance between A & B (1)

Two Prospect Portfolio – Expected Values & Standard Deviations		
Prospect	Expected Value = Probability of Success * Mean Value (MMBOE)	σ Standard Deviation about the Mean Value
A	30	30
B	30	50
50/50 Mix of A & B	30	?

Table 6.4.2

Since COV_{AB} is the covariance and $\overline{A} \times \overline{B}$ are the respective means.

$$COV_{AB} = \frac{\sum_{i=1}^{i=N} A_i \times B_i}{N} - \overline{A} \times \overline{B} \qquad (2)$$

Expressing the covariance relative to the (geometric) average of the variances of A and B gives:

$$\text{Correlation Coefficient} = R_{AB} = \frac{COV_{AB}}{\sqrt{VAR_A \times VAR_B}} \qquad (3)$$

Or alternatively:

$$COV_{AB} = R_{AB} \times \sigma_A \times \sigma_B \qquad (4)$$

Substituting this into (1) gives:

$$VAR_{A+B} = VAR_A + VAR_B + 2 \times R_{AB} \times \sigma_A \times \sigma_B \qquad (5)$$

Letting M be a portfolio of A and B, with a fraction f of Prospect B and (1-f) of Prospect A, so in all cases we are talking about a portfolio comprising one net-interest prospect.

$(\sigma_M)^2 = ([1\text{-}f] \times \sigma_A)^2 + (f \times \sigma_B)^2 + 2 \times R_{AB} \times ([1\text{-}f] \times \sigma_A) \times (f \times \sigma_B) \qquad (6)$

Equation (5) is plotted on Fig 7.4.3.

[3] A 100% holding in Prospect A is not a solution; with $\sigma = 30$, there is the possibility that even if exploration is successful only 20 MMBOE of reserves will be found.

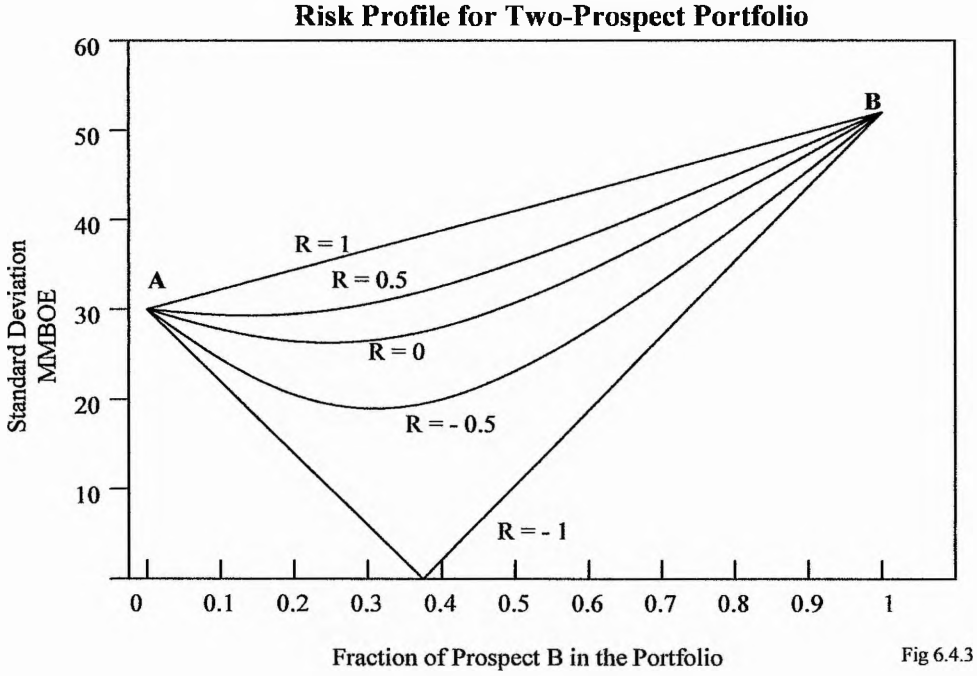


Fig 6.4.3

Analysis of this chart reveals that anything less than perfect positive correlation (correlation co-efficient R = 1) between prospects A and B can potentially reduce risk[4]. If R = 0, a portfolio consisting of 73.5% of A and 26.5% of B would confer minimum risk – a standard deviation of 25.7 million barrels. The ideal scenario R = -1, is also displayed, but as Barry (1993, p.151) reports 'perfectly negatively correlated exploration prospects don't exist in real life'.

[4] Although the covariance of Prospect A relative to Prospect B, in Barry's (1993) example, is measured with respect to technical risk (drilling success), the covariance of Prospect A relative to Prospect B could be measured with respect also to political risk or security. For example, let us consider only security risk. Prospect C is situated in a Western country with a stable democracy and resolute internal sovereignty. Prospect D is situated in a Non-Western country which habitually suffers from insurgency. This insurgency has occasionally affected the drilling activity being undertaken on Prospect B. Work has been halted in the past until the security situation stabilises. Comparison of the monthly hours of activity able to be undertaken on each prospect over the last 3 years, would enable a covariance measure to be calculated.

Moving from a two prospect portfolio to a multi-prospect portfolio the following equation (6) can be generalised for N prospects:

$$(\sigma_M)^2 = \sum_{i=1}^{N} (f_i \times \sigma_i)^2 + 2 \times \sum_{i=1}^{N} \sum_{j=1}^{N} f_i \times f_j \times R_{ij} \times \sigma_i \times \sigma_j \qquad (6)$$

for $j < i$

Assuming each of the N prospects is similar to Prospect A, with an Expected Value of 30 MMBOE and Standard Deviation of 30 MMBOE, then iso-correlation curves may be plotted for a multi-prospect portfolio, as in Fig 6.4.4.

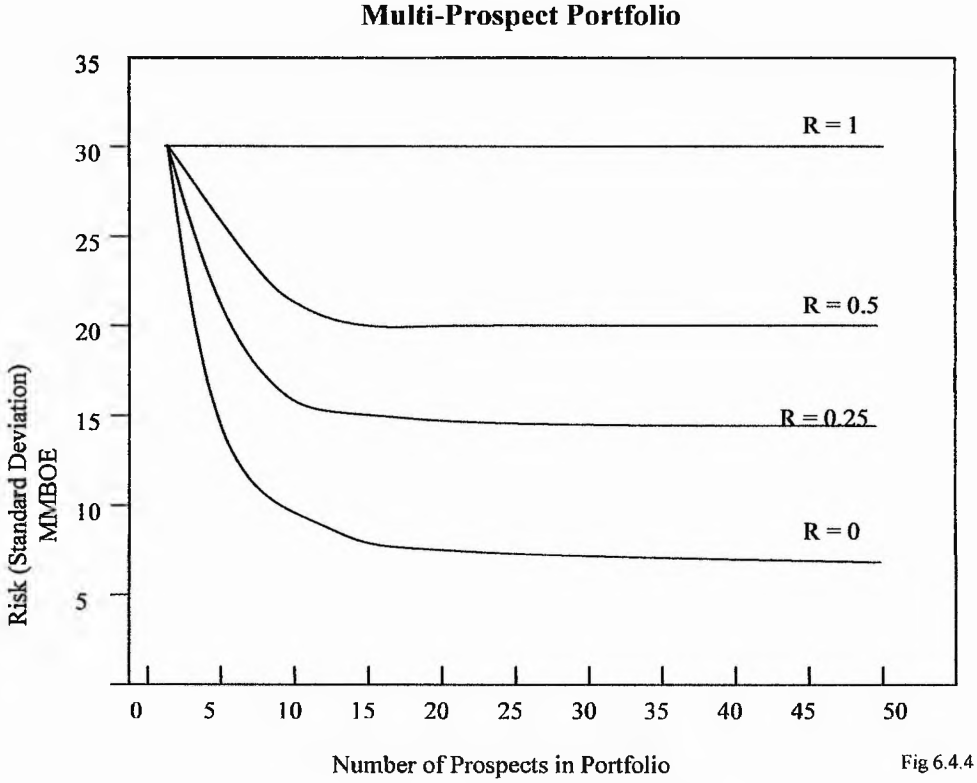


Fig 6.4.4

As the graph displays (Fig 6.4.4), the first moves to diversify are those that have the most significant proportionate impact upon overall risk. The first few additional prospects added to the portfolio, rapidly cause risk to be reduced. The objective of reducing risk in this manner may explain why *Portfolio diversification* is the most frequently noted rationale for an Independent's first internationalising move.

An additional, contributory rationale given for the British Independents' first internationalising move was to *Utilise existing contacts* (Fig 5.6.2). The *Utilisation of existing contacts* was mentioned by 40% of Independents (4/10). For example, Independent E reported its first overseas move into Country X was as a result of the Chairman's historic ties to Country X. It was revealed that the present Chairman had emigrated to a Western state, following the murder of his father, who had been a political opponent of Country X's oppressive Communist leader. In later years, with the existing Communist leader overthrown, Country X moved towards a capitalist system. Having established an Independent E&P company in another Post-Communist state, the Chairman sought to return to Country X where, it was reported, "within the establishment" he "knew a lot of people in a lot places there". Utilisation of contacts was a key stimulus to this first internationalising move.

Comparing the above three factors, to the most significant factors unveiled in Landeau's (1977) study (see Section 3.4.2) only the *Greater potential of oil/gas areas abroad* was specified in both studies. Clearly, a different set of factors stimulated British Independents to first internationalise than was present for US Independents. Part of the explanation for this difference may be because the majority of British Independents were 'Born Foreign' (see Section 5.6.4). From start-up several British Independents were located in a comparatively[5] *High Return* area with *Low finding costs*, therefore their move into a second country was stimulated by other reasons, such as *Portfolio Diversification* and *Utilisation of Existing Contacts.*

The *primary rationale* given for an Independent's *first* overseas expansion (Table 5.6.3) was found to differ from the *current* rationale of seeking to increase the extent of its international operations (Table 5.6.4). The main reason for the difference seems to lie in the *Company's oil/gas reserves expansion.* This reason is found to be of minimal significance to an Independent's first move abroad, and was only specified by 10% of

[5] Compared to the US, which has the lowest average number of discoveries per exploration well in the world (Masseron, 1990, p.18), countries such as Azerbaijan, Ukraine, Russia, Senegal are *High Return, Low finding cost* areas.

Independents (1/10). Yet it is a key stimulus to current intentions to increase their international operations, as specified by 42% of Independents (5/12). The cause of this differential might be that Independents had few reserves when they first moved overseas. The reason why the first international move by Independents was not stimulated by the need to expand reserves may have been simply because the companies were still in the process of establishing initial reserve bases. They may not have had reserves to expand upon.

The prominent status that *Company's oil/gas reserves expansion* receives as a key rationale for Independents currently seeking to increase their international operations, demonstrates their commitment to company net asset growth. As reported in Section 3.4.2, investor valuation of Independents is focused upon reserves and reserves' growth (Bauquis, 2000; Antill and Arnott, 2000; Rose and Wilders, 2003). The Independents' emphasis on this rationale for further internationalisation, demonstrates an awareness and commitment to share-price performance.

Similar to results for the Independents' first international expansion, a further *primary rationale* for Independents currently seeking to increase their international operations was the *Greater potential of oil/gas areas abroad* (Table 5.6.4). This factor was selected by 30% of the Independents (4/12). The perceived under-explored potential of particular countries (O'Connor, 2000) clearly acts as an attractor for further international expansion.

In summary, the three most frequently given reasons by British (Fig 5.6.2) Independents for *currently* seeking to increase their international operations are:

i) *Company's oil/gas reserves expansion.*

ii) *Greater potential of oil/gas areas abroad*

iii) *Portfolio diversification*

Thus, the strong objective among Independents to increase their international operations (12/14) is founded upon the desire to target under-explored areas, mitigate risk through

diversification and most importantly boost company share-price through an expanded reserve base.

6.4.2 The Non-International

Only Independents, D and F, were found never to have internationalised their operations. *Geographical focus* was the rationale given by both firms for not seeking to expand abroad. Independent D was more internationally orientated than F, and plans had been drawn up for the company to expand overseas within the next five years. Further probing, on why Independent F did not strive to expand overseas, provided responses which were supportive of Hymer's (1976) 'liability of foreignness' thesis. Hymer (1976, p.34) reasoned that the differences between markets meant the knowledge and capabilities developed by a firm within in its own domestic markets were not necessarily applicable to a new foreign market. Instead, new knowledge and capabilities must be acquired or developed. He proposed that foreign entrants into another market may face additional costs, not borne by indigenous competitors. For Independent F, these costs were "administrative". Eight years earlier, the firm had attempted to internationalise into a foreign country, geographically close to its existing domestic operations. However, it had found the burden of a foreign language, as well as a differing tax system, to be overly cumbersome. Although the 'liability of foreignness' may be supported for this Independent, in aggregate, the high levels of international activity undertaken by the British Independents (17/21), would suggest the 'liability of foreignness' does not always hold for all firms. Hymer (1976, p.12) also incorporated the idea that, under certain circumstances, there may be advantages to 'foreignness'. For example, a foreign firm may have access to, or possession of resources unavailable to domestic firms. Hymer regarded this as being a possible scenario for companies of more advanced nations which were investing in less advanced ones. Should the company from the advanced nation have access to greater experience, finance, skilled personnel and technology than the domestic firm, then the foreign firm would possess a comparative advantage. Such comparative advantage might explain why the majority of British Independents undertook their activities outside of the UKCS. For example, Independent J acknowledged that it would only consider areas where it held a "competitive advantage"

relative to others. The firm did hold activities in its "own backyard", the UKCS, because each current member of their management team had at least 20 years of knowledge and experience of working in the North Sea. However, when the company sought licences abroad, it would only consider "new areas"[6], those where "everyone [all the competition] has little knowledge". It was in these new areas that the firm could and would "compete". The "Gulf of Mexico" and other "established areas" which "everybody knows about", were to be avoided.

Returning to Independent F, part of the reason why internationalisation may not have occurred for this firm may also be a product of the knowledge possessed, and experience gained, by the founding Chief Executive Officer (CEO). With a background in investment management, this CEO was not typical of most Independents' leaders who had worked for international petroleum companies prior to joining or founding their own or another Independent[7]. The lack of international experience of this CEO may partly explain the company's rationale for having never expanded overseas. The investigation of Manolova et al. (2002) into 121 small industrial technology firms, revealed a positive and significant relationship between the owner/manager's international business skills and small firm internationalisation ($p < 0.001$). Their findings indicated that owners/founders of small firms were likely to draw on their international skills, competencies and experience when internationalising. The existing international business skills of the top manager were strong determinants of whether or not a firm would internationalise. Manolova et al. (2002) found strong support for a resource-based view of the firm, with respect to the internationalisation of small firms. Further corroboration of their resource-based reasoning is provided by our North American results. One of the rationales given, by 60% of the North American Independents (3/5), for not seeking to increase their international operations outside of North America, was because such a venture was *Beyond staffs' experience*.

[6] The countries into which the firm had invested fitted O'Connor's (2000) non-traditional definition.
[7] Independents B, C, D, E, G, I, J, K, L, M, N all possessed CEO's with international experience.

From the above, it may be inferred that those companies which do not internationalise choose to do so out of resource weakness, rather than strength. For example, whilst it does appear that Independent F has not expanded abroad, because of its management's lack of experience in the international petroleum field, this does not necessarily imply the company is competitively weaker. Indeed, its focus upon one market may be its source of advantage within that market. Nachum (2003), when discussing the performance of internationalising firms, expresses the importance of maintaining balance. Hymer's (1976) thesis recognised both the strengths and weaknesses of foreign entrants vis-à-vis local competitors. Developing this argument, Nachum (2003) explicitly presents the notion of substitution between *advantages and costs* in determining the performance of internationalising enterprises. The formal presentation of her reasoning is as follows:

$$P_i = f\ (A_i\ ;\ C_i)$$

Where P_i is the performance of foreign firm i, and A_i; C_i represent vectors of advantages and costs, respectively. Applying Porter's (1985) theory of focus to the above expression may justify a geographically focused strategy. Porter reasons that *focus* can confer competitive advantage by being cost reducing (Porter, 1985). The additional costs such as 'discrimination by government, by consumers, and by suppliers' (Hymer, 1976, p35), as faced by foreign entrants, should be greatly minimised by the geographically focused firm. With *Geographical focus* being the most frequently referenced rationale by both British (2/2) and North American Independents (5/6), for not seeking to increase their international operations, the importance of this factor must be acknowledged. As Independent F reported, a further reason for not internationalising was to "exploit the goodwill we have created in Country Y, and build on our strong track record". Such cost advantages of the geographically focused firm may place it in a strong competitive position, relative to the foreign entrant.

6.4.3 Mode of Entry

For 70% of responding Independents (7/10), their first licence abroad was undertaken as Operator (Section 5.6.3). This contrasts with our adaptation of the Uppsala model (Section 3.4.3), that would predict an Independent's first licence holding abroad to be most likely undertaken as Non-Operator. To be Operator, and direct the activity

undertaken on a particular licence, requires a greater commitment of a firm's human capital resources than when holding the position of Non-Operator (Section 3.4.3). The Uppsala model predicts that a firm will enter new markets in an incremental manner; minimal resources are committed initially, but with time more resources are progressively applied[8]. The reason given by most Independents (3/5) for choosing to be Operator related to *control*. As Independent B commented on why control was important, it is "hard to add value as Non-Operator, invested in someone else's ability." Independent M reported they were "Operator from the beginning because they needed to control time and spending". This position suggests, that whilst Operating does require more resources, the control confers benefit. The interviewee went on to state, that "if [they] hadn't controlled, [they] would never have got to development and production". Although Operating does require more resources, it appears Independents perceive the control-benefits conferred in proposing and directing a work programme, off-sets the additional resource costs. When Operator, an Independent has control over implementation of the project's schedule – they can direct actions to be taken as and when it is most suitable to their company[9]. The desire for control as Operator may also be generated out of necessity. As Independent M reported, had they not Operated, the project would not have been implemented. Their idea and/or commitment to undertake the particular project was unique to their company. This response is similar to Independent A's reasoning for taking the role of Operator. Being the first entrant into Country Z, the Non-Operator option was not available to Independent A. If their drilling ideas were to be executed, then they would have to implement them. Although, this concept of Operatorship through necessity appears fruitful, no interviewee expressed unwillingness towards taking on the responsibility of Operator. Whilst industry literature as to why companies seek Operatorship is sometimes simplistic, 'Operating is fun' (Barry,1993, p.5), the current research reveals the predominant reason is control.

[8] In the Uppsala model, this meant a firm would first *export* to a new country before the more resource intensive move of FDI was enacted. FDI, for example, would involve the setting up of a production plant in the new country.

[9] For example, authority over the project schedule will enable a company to tailor the timing and size of cash input requirements in a manner that may be more convenient to their finance programme.

Independents when first internationalising wished to maximise control of their FDI activities.

6.4.4 Choice of Country

A resource-based concept of internationalisation, akin to that formulated by the Uppsala School[10] (Johanson and Vahlne, 1977; Johanson and Wiedersheim-Paul, 1975) (Section 3.4) was found to be the most frequent *primary rationale* given by Independents for choice of country (Fig 5.6.6-7). Twenty-four percent of the countries in which Independents held activities were chosen, because the Independent already possessed the necessary *Knowledge/Experience*. As clarified in Section 6.6, the *Knowledge / Experience* category could include the following responses: that the firm's managerial personnel had knowledge / experience of working in the country before; that the geology was similar to, or a spatial extension of, the geological basin with which the firm was familiar; or finally, that the specialist techniques required of the asset were similar to what the firm had implemented elsewhere. The geographic expansion followed by Independents often appears to seek those countries where existing *knowledge and experience* can be applied best. As Zahra et al (2000) report, geographic expansion may be used as a method of applying existing core competencies across a broader set of markets. For 24% of the countries chosen by Independents, this is found to be applicable.

The next most important primary reason for country choice, was a country having been *Under-explored* (Fig 5.6.6). Once more, most of the countries for which an *Under-explored* answer was specified[11], corresponded with O'Connor's (2000) non-traditional petroleum areas. Fifteen percent of the countries in which Independents held activities were chosen because the countries were considered *Under-explored.* British

[10] The Uppsala School found internationalising exporting firms to target those countries most akin to the markets they already served. The rationale supporting this finding, was that firm's tended to leverage their existing knowledge and experience when choosing particular countries. As Anderson (1993, p.211) reports, in the Uppsala model the 'outcome of one cycle of events constitutes the input to the next'. A firm's existing knowledge about markets and operations determines the path of the next international move.

[11] Countries specified as Under-explored by Independents included: Ghana, Guinea Bissau, Kenya, Mauritania, Montenegro, Myanmar and Pakistan.

Independents appear to have a propensity for undertaking activity in the non-traditional petroleum areas.

An additional *primary reason* specified for choice of country was *Opportunistic*; a suitable deal opportunity suddenly arose, to which the Independent reacted. Fourteen percent of countries were chosen by Independents for this reason (Fig 5.6.5). The Independent had not specifically been seeking to do business in that particular country, but on becoming aware of a particular opportunity, moved rapidly to seize it[12]. Measured along this dimension, Independents displayed an entrepreneurial flair, for they appeared to exemplify Kirzner's (1973, p.34) 'alertness' to new opportunities. Cross-referencing with our results for decision-making speed (Table 5.3.1), the process of securing new licences (Business Development), was stated as the area where Independents' decisions were made most rapidly. Chen and Hambrick's (1995) research would support this finding. Comparing the competitive behaviour of smaller firms to larger, they found small firms implemented their competitive actions more quickly. As Pech and Durden (2003) reported, decision-making speed can confer the ability to out-manoeuvre the competition, regardless of its scale. The ability of Independents to *rapidly* seize new asset *opportunities* may be a source of strength that works to the Independents' advantage.

Having identified *Existing Knowledge / Experience*, *Under-explored potential*, and *Deal Opportunity* to be the most frequent *primary rationales* given by Independents for country choice, it must be recognised also that several alternative rationales were given. Displayed in Fig 5.6.5, the wide range of other reasons offered demonstrates the multiplicity of factors that influence country choice. Nevertheless, the above three are

[12] For example: Independent C recollected that its move into a Post-Soviet Country A, was purely stimulated by chance. During casual conversation with an agent assisting them in a take-over bid, the agent made reference to a group of businessmen from Country A who were looking for a Western public company in which they could invest. In return, they would use their connections to "put things on [the appropriate officials'] desks". "They would put money in [into Independent C] and introduce us to deals in Country A". Another example was given by Independent L, in their recognition of a "market opportunity". An asset for sale in Country B, was mainly recognised for its oil, and gas was currently flared off. Differing from the common perception, Independent L valued the asset in terms of gas not oil. "Nobody realised the gas had value", [so we seized the] "opportunity".

representative of the most common rationale given by Independents for country choice, and are therefore deliberately highlighted.

6.4.5 Born Foreign

The majority of Independents were 'born foreign' (Table 5.6.7). For example, the company's headquarters might be in the UK, but its first active interests might be in a foreign country. Independents were not found to adhere to the 'born global' terminology of Bell et al (2004) (Section 3.4.5), which would require a company, from its birth, to start with interests in several countries, almost simultaneously.

The foreign orientation of British Independents (Table 5.6.6) contrasts with the orientation of the North American Independents (Table 5.6.7). Apart from *Edinburgh Oil and Gas*, all British Independents were engaged in overseas E&P activity. Most were also international, 76% (16/21), holding licences in two or more countries. In contrast, only 44% (24/55) of North American Independents had activities outside of North America. For the British Independents, international activity is not associated with firm size. Both small and large British Independents are international in their activities (Table 5.6.6)[13]. North American Independents differ. For them, size of firm is associated with the propensity to undertake international activities (Table 5.6.7). Most of the smaller North American Independents, those that are similar in size to British Independents, did not have activities outside of North America. Results show that British Independents are more international in their orientation, compared to North American Independents of equivalent size. The recent switch of the now British registered *Global Energy Development Corporation*, from its previous New York Stock Exchange Listing, is testament to the international orientation of Independents quoted on the London Stock Exchange. *Global Energy* reported the Alternative Investment Market (AIM) of the London Stock Exchange as having been chosen for 'its receptiveness to internationally focused companies with potential for growth.' (Annual Report, 2002, p.1).

[13] A propensity to internationalise may be an emerging characteristic of the British petroleum industry. Thus, Keogh et al (1998) report the growing tendency of UK petroleum technology service firms to seek expansion abroad.

The international orientation of British Independents of *all sizes* does not accord with existing empirical studies of FDI. Most research shows that the incidence of an international move to undertake FDI abroad is positively associated with firm size (Yu and Ito, 1988; Baird et al, 1997; Kuo and Li, 2003). As Baird et al (1997) reported, for their study of 160 Indiana SME's, firms with an international strategy were significantly larger than non-internationally orientated firms. In contrast to the British Independents, the North American Independent population does appear to support this traditional positive association between firm size and internationalisation. Cross-tabulation results show that the majority of large North American Independents (> £1000m market capitalisation) do undertake international activities, whilst the majority of small North American Independents (< £1000m market capitalisation) undertake only domestic activities (Table 6.6.7). Similar to Maponga and Maxwell's (2000) findings for the increasing internationalisation of 'Junior' Australian mining companies, British Independents are now mainly internationally orientated[14]. With recent research emphasising the importance of SMEs as a vector of Foreign Direct Investment (Oviatt and McDougall, 1997; Reynolds 1997; Urata and Kawai, 2000), British Independents should be regarded as part of the vanguard.

6.4.6 Business Model

Analysis of the population of British Independents reveals two distinctive polarities between which the Independents' business models tend to lie. The opposing polarities, as displayed in the spectrum diagram of Fig 6.4.5, are *geographic focus* and *geographic diversification.*

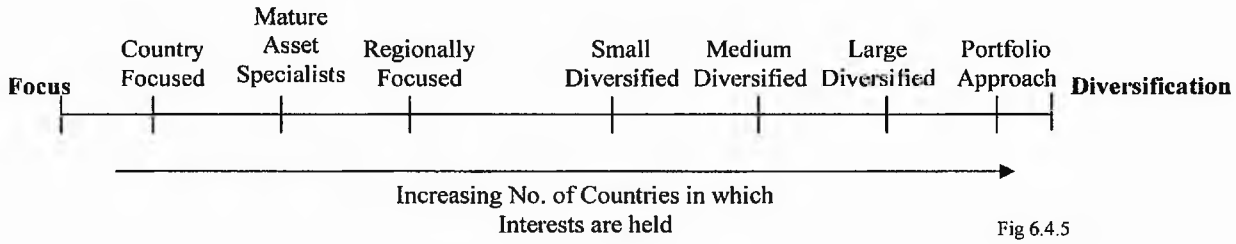


Fig 6.4.5

[14] During the 1970's the majority of the LSE listed British Independents were mainly focused upon the North Sea. Such companies included Aran Energy, Cluff Oil, Clyde Petroleum, Floyd Oil, GOAL, LASMO, Marinex Petroleum, Pict Petroleum, Premier Oil (Davis, 1981).

Examination of the set of business models identified in Section 5.6, reveals each model to lie within the spectrum between these two polar points (Fig 6.4.5). A positioning orientated towards either node has associated strengths. Thus, *geographic diversification* can reduce the covariance of assets (Markowitz, 1970; Vickers, 1987), whilst *geographic focus* (Hymer, 1976; Porter, 1985) can confer competitive advantage through cost reduction (see Section 6.4.2 above). The consistent share price rises of both *Portfolio* diversified Paladin Resources (FT, 2004a) and *Country Focused* Edinburgh Oil and Gas (FT, 2004b) over the last four years, suggests that either orientation can be rewarding[15].

Geographical focus versus *geographical diversification* may be considered as approximating to the internationalisation patterns of 'Deepening' and 'Widening' respectively, which were identified by Ietto-Gillies (1996) for UK firms. As Ietto-Gillies (1996) found, the 'Deepening' pattern occurred when a company continued to become more involved in the same group of countries in which it already operated. By contrast, a 'Widening' pattern was displayed when companies continued to spread their activities out over more and more countries. Within our population of British Independents, both patterns may be identified among the various business models. Among those business models characterised by a geographically focused strategy, such as *Country Focused*, *Mature Asset Specialists*, and *Regionally Focused*, the process of 'Deepening' may be detected for their relevant Independents. For example, 'Deepening' is illustrated by Sibir's sale of its remaining UK and Italian assets in July 2001, which enabled the company to achieve its 'goal to be solely focused on Russia' (Annual Report, 2001, p.3). Further, Venture Production illustrates 'Deepening' by its growing commitment to the North Sea, with a further five asset acquisitions being made there in 2003 (Annual Report, 2003, p.4). Finally, Cairn Energy also illustrates 'Deepening'. Its 2003 'disposal of non-core North Sea interests' is because its new 'core area of focus is South Asia' (Annual Report, 2003, p.4). At the other end of the spectrum are those business models that imply more geographic diversification. For the constituent companies of these

[15] This statement does not imply factors, other than international strategy, are not of influence. A reported strength of Paladin Resources, often detailed by investment analysts, is the ability of the company's management at 'valuing deals' (Rose and Wilders, 2003, p.17).

models, a widening strategy may be observed. For example, Tullow's operations, in the context of a range of emerging international prospects forecast for 2003, have been described as follows: 'Business development and the acquisition of new interests have always been central to Tullow's growth strategy.' (Annual Report, 2002, p.4)[16]. Similarly, Premier Oil, in the context of its 'worldwide licence interests' reported that 'Exploration new ventures have commenced in North East India and Gabon in 2002, continuing the regeneration and replenishment of Premier's exploration portfolio' (Annual Report, 2002, p.10)[17]. A final illustration would be the wide scope of Soco International's 'portfolio of oil and gas assets'. Its 'core areas' now include the Far East, North Africa, Southeast Asia, and the Middle East. In summary, Ietto-Gillies' (1996) identification of 'Deepening' versus 'Widening' internationalisation patterns appears to support the *Geographical Focus* versus *Geographical Diversification* approaches, respectively, exhibited in the business models of British Independents (Fig 6.4.4).

Although there is empirical support for most of the business models, on closer examination the dichotomy between 'Deepening' and 'Widening' is not evident for the *Portfolio Approach* business model. Independents within this category take a middle-ground. Whilst *widening* the international spread of their Non-Operated activities, they *deepen* their Operated commitment in only a few countries. Thus, Sterling, Dana, and Paladin only Operate licences in a total of 1, 3, and 2 countries respectively (Table 5.6.14). As the DTI's 22nd Licensing Round revealed (15th September 2004), Sterling Resources continues to *deepen* its commitment to the UKCS; Sterling gained a further 6 licences as Operator.

6.4.7 "Basket-case Countries" – A grain of truth?

Analysis of the countries in which Independents hold licences reveals a number of Independents to be more strongly orientated towards certain countries that are

[16] Tullow's date of incorporation (establishment) being in 1985, and Cairn Energy's in 1986, show that, despite the two firms' similar temporal origins, their internationalisation strategies followed differing paths. Cairn 'deepened' its commitment to India and Bangladesh; whereas Tullow continues to 'widen' its international operation.

[17] Examination of Premier Oil's 2001 annual report reveals that neither country featured in its portfolio the previous year.

characterised by relatively high political and/or security risks. In this respect, some Independents do target the "Basket-case" countries upon which Analyst A reported. Existing research demonstrates that both *corruption* and *political instability* within a country are negatively associated with foreign direct investment (Mauro, 1995; Wei, 2000). Applying this finding to petroleum licensing, the greater the corruption and political instability within a country, the lesser competition there will be for licences. Closer examination of *previous choice of country* results reveals that 14% of the countries (9/64), in which Independents held interests, were partly chosen because of the *Low Competition* for licences (Fig 5.6.7). Countries included within this list were also shown to score poorly on both *corruption and political stability* indices (Table 5.6.16).

Although the majority of Independents were shown to be working in some corrupt and politically unstable countries (Section 5.6.7), a few Independents are distinctive in that they are *mainly* active in such countries (Table 5.6.15). Included in this group are Sibir, Regal, Premier Oil, Emerald, Global Energy, Tullow and Soco International. As an interviewee from Independent L, one of this group stated, "Our company is less risk averse than some Majors". This firm was more "happy with security risk" than others. The interviewee reported that, in the case of one country they had entered, the British Government told the firm to leave, but "We said, 'No'". He continued: "If you want to find something big, you have to go where no one has dared go before." Independent E, another constituent of this grouping, related that competition in Country Z, was "still very low due to political risk, therefore not many are interested". Such responses, together with the index findings (Table 5.6.15), show certain Independents to be more orientated towards high political/security risk countries than others. These findings corroborate those of Delios and Heinsz (2003). Examining the international expansions of 665 Japanese manufacturing firms, they found firms with extensive experience in politically hazardous countries had a 58.5% greater probability of entering another hazardous country, than a firm with no experience in hazardous countries. With certain Independents, there appears to be an active willingness to engage in countries with political risks. Although not the focus of Maponga and Maxwell's (2000, p.203) study, they similarly note many 'Juniors to have opened new frontiers ignored by large companies' because of their 'political and social risk'. The incidence of some smaller

mineral and petroleum based resource companies, actively targeting countries of higher political and/or security risk, for reasons of lower competition, may have general application.

7. OVERVIEW OF FINDINGS

7.1 Introduction

Set within the growing field of SME research, this thesis has explored the organizational strengths and competitive strategies exhibited by British Independent Petroleum Exploration and Production companies. This research topic was developed along four principal channels of inquiry: 1) *Strategic Decision-making Speed and Rapidity of Action* 2) *Utilisation of Contractors* 3) *Negotiation* 4) *International Strategy*. The main findings of the research are founded on novel data (both quantitative and qualitative), gathered by the author through a series of semi-structured face-to-face interviews with fourteen Independents and seven international drilling contractors.

7.2 Organizational Strengths

According to untested industry wisdom, Independents were thought to be faster in their decision-making speed than Majors (HCSC, 1988a, p.viii; Section 1.2). The present research supports this claim (Section 6.1.1.1.). The difference in decision speed between Independent and Major may partly be attributed to the difference in firm size. Inspection of the Independent sample reveals, smaller Independents to make faster decisions than larger Independents (Section 6.1.1.2). These findings correspond with Wally and Baum's (1994) research, where larger manufacturing firm size was correlated with slower decision speed. In our study a range of structural variables were recognised as potential influences upon decision-making speed (Section 6.1.1.1.). These included: *Centralization* (concentrated decision-making authority), *Vertical Specialization*, *Formalization*, *Horizontal Specialization*, *Spatial Proximity*, *Focus*, and the *Spectrum of Consultation*. Specific investigation of the latter influence, suggested support of Hypothesis 3(a) (Section 3.1.2), that the greater the number of personnel consulted to enact a given decision, the longer will be the time taken to choose a course of action (Section 6.1.1.3.). Furthermore, firm size was significantly correlated with the spectrum of consultation; the larger the firm, the more personnel were consulted for a given decision (Section 6.1.1.3). These results suggest, that the reduced division of labour (and hence the greater requirement for flexibility) among firms of smaller size (Reid, 1989; Bernadette, 2004) may augment their strategic decision-making speed. Whilst the

division of labour is associated with processing efficiencies for standard, routine tasks, this may not hold for non-routine, strategic decisions. Decisions of such magnitude require the simultaneous assimilation and assessment of all the necessary information. In a small firm, with the required information being held by fewer persons, it can be gathered and assimilated more quickly. As Williamson (1996; 1967) reasons, small firms having fewer tiers of hierarchy are less likely to suffer from transmission distortion (Bartlett, 1932). Thus, an organizational strength of the small firm is its ability to make rapid decisions.

A further organizational strength of the Independent was their less formalized approach to business deals. Independents were reported to display more relationship-based, rather than formalized, business procedures (Section 5.3.1, 5.5.3). The power of relationship upon negotiating scenarios has been recognised by previous research (Sondak, et al, 1999; Halpern, 1994). Indeed, Greenhalgh and Chapman (1998) show it to be associated with joint negotiating gain. Various Independents flagged their ability to develop relationships, as one of their key strengths when applying for exploration licences in Non-Western countries (Section 5.5.3). This strength fits the operating disposition of Non-Western government bureaucracies (Peters, 2001; Ye, 2003; Dimitrov, 2003), where licensing authority selection procedures were found to be more relationship than formally based (Section 5.5.3). Although as previously discussed (Section 6.3.4), *Seniority of company representatives* and their authority to commit will likely augment relationship development, the ultimate source of this relationship based approach, we argue, is derived from the organizational properties of the Independent firm. With fewer tiers of management in the smaller firm (Mintzberg, 1981), the principle-agent problem of information asymmetries between high echelon Directors and lower echelon workers (Jensen and Meckling, 1976) is likely to be reduced. The monitoring cost incurred by Directors (principals) for determining what workers (agents) are doing, is mitigated because of two factors. Firstly, transmission distortion is reduced (Bartlett, 1932) because information passes through fewer managerial layers before reaching Directors. Secondly, agents are strongly motivated to perform. As an interviewee from Independent E acknowledged: "I know what I do makes a difference to the company...very small

difference between daily work and company performance." These above properties reduce the need for formalized monitoring mechanisms in small firms. Indeed, 'formal controls are discouraged' and a more personal element prevails (Mintzberg, 1989, p.117). Our results show that this less formalized approach to internal organization is replicated in the approach adopted with external parties; namely, Non-Western government licensing agencies and drilling contractors (Section 5.5.3 & 5.3.1).

The in-house functional strengths possessed by Independents were found to match three general areas of capability (Section 5.4.1.1). These are: (1) value generation through deal making and managerial co-ordination; (2) assessing petroleum/reservoir dynamics in order to locate and extract the petroleum; and (3) monitoring and controlling the execution of drilling/production work programmes. The internal capability of Independents is grounded in human, rather than physical capital. The co-ordinating role of the entrepreneur is fundamental to their functioning. Focused upon these three capabilities, Independents show close resemblance in their structure to that set out by Mintzberg's (1989) *Entrepreneurial Organization.* Thus, emphasis is upon the co-ordinating Strategic Apex (Capability 1) and essential work, that is undertaken by the Operating Core (Capabilities 2 & 3).

7.3 Organizational Weakness

Although the identification of Independents' organizational weaknesses was not an objective of this thesis, the frequency with which results indicated Independents to be financially constrained should be noted (Section 5.3.2., 5.3.3., 5.4.2.2, 6.1.2.1., 6.1.2.3., 6.2.9). Our results for Independents confirm the finding of Michaelas et al (1999) that smaller firms face higher financial barriers. Indeed, this was a feature recognised indirectly by McKie (1960, p.552), when he detailed that Independents undertook less expensive exploration wells than Majors (see Section 2.1). One can argue that the financial constraint of Independents is a consequence of the limited asset base that they can use as collateral for lenders. With fewer assets, compared to larger companies, Independents are more prone to suffer from both Gambler's ruin (McCray, 1975; Newendorp, 1996) and Credit rationing (Calomiris and Hubbard, 1990).

7.4 Competitive Strategies

Application of organizational strengths is recognised in the competitive strategies and actions exhibited by Independents. In accordance with McKie's (1960, p.570) observation that Independents take advantage of 'flexibility and speed in detecting and seizing available opportunities', it was in the process of securing new licences (Business Development) that British Independents were reported to make their decisions most rapidly (Section 5.3.1, 6.1.1.5.). Independents behave as in Kirzner's (1973) description of alertness to new opportunities (Section 6.4.4), as they readily seize licensing 'windows of opportunity' (Wickham, 2001). The importance of speedy decisions and action as a competitive tool to outmanoeuvre larger firms (Chen and Hambrick, 1995; Pech and Durden, 2003) is similarly suggested by our results.

With the internal organization of Independents being potentially limited in their formalization, it is unsurprising that formalized incentivisation schemes were not resolutely present in the contracts they established with Drilling firms (Section 5.4.2.2). Several Independents (≈40% of our sample) themselves bore the risk of costly over-runs and delays in work completion (Kemp and Stephen, 1997; 1999) by solely formulating non-incentivised day-rate contracts. For such companies, the prevalent opportunism of which Williamson (2002) warns is seemingly not always apparent. Our result accords with existing criticism of Williamson's concept of opportunism (Kay, 1993; Casadesus-Masanell and Spulber, 2000), and further points towards the substance that Richardson's (1972) co-operative, trust based framework holds for interpretation of contracts between firms (Section 6.2.9). If a balanced perspective is to be achieved, both Richardson's and Williamson's interpretative schemas are required in analysing contractual arrangements.

Independents' strengths in the *approach factors* of *Decision-making speed*, *Authority to commit / Seniority of personnel*, and *Establishment of relationships*, appears to fit the licensing authority *context* of Non-Western countries, where *approach factors* are of greater influence (Section 6.3.4). With findings showing Independents to hold mainly Operated licences in Non-Western countries and Non-Operated licences in Western

countries (Section 5.6.3), this thesis suggests that such a result may be the consequence of Independents successfully applying their strength in *approach factors* to the Non-Western context. By targeting the relationship-based selection procedures of Non-Western licensing authorities, Independents may be leveraging their strength in relationships to secure the position of Operator.

The majority of Independents (16/21) are international in their activity. The initial rationale which stimulated such a strategy was found to be the product of a combination of factors namely: 1) the *Greater under-explored potential of oil/gas areas abroad*; 2) *Portfolio diversification*; and 3) *Utilisation of existing contacts* (Section 5.6.1, 6.4.1.). In contrast to the predictions of the Uppsala Model (Johanson and Vahlne, 1977; Johanson and Wiedersheim-Paul, 1975) (Section 3.4.4), most Independents (70%) entered their first country abroad playing the resource intensive role of Operator (Section 5.6.2, 6.4.3). The reason given for this choice was that Independents perceived there were control benefits conferred in proposing and directing a work programme, which had greater influence than additional human capital costs. Although deviating from Uppsala School predictions for Mode of Entry, Independents' behaviour regarding Choice of Country does confirm with a resource-based concept of internationalisation (Section 3.4.3). The most common primary rationale for a country being chosen was because the Independent already possessed the relevant *Knowledge/Experience* (Section 5.6.3., 6.4.4.). Being small and of limited resources, several Independents, rather than venturing into wholly novel areas, followed an international strategy which built upon existing capabilities. For many Independents geographic expansion is used as a method to apply existing core competencies across a broader set of markets (Zahra et al, 2000).

In contrast to McKie's (1960, p.570) comments that Independents 'specialize in restricted areas which they can study intensively', the analysis of British Independents reveals that international strategies of both Focus and Diversification are utilised (Section 5.6.5., 6.4.6.). Similar to the internationalisation patterns identified by Ietto-Gillies (1996) for UK firms, some Independents display a 'Deepening' strategy, becoming more focused upon a particular country or set of countries, whilst other Independents display a

'Widening' strategy, and continuously spread their activities over more countries. Deviation from McKie's (1960) observations may be because his sample was based upon US Independents, not British. Our results show British Independents have a greater propensity to engage in international activities than North American Independents of equivalent size (Section 5.6.4.).

A further aspect identified by McKie (1960, p.570) which appears applicable to some of the competitive strategies adopted by British Independents, is that 'Independents congregate in areas where the relative advantages of Major firms are weakest.' Our results show certain Independents to specialise in high political/corruption risk countries, "where no one has dared go before" (Independent L). Both corruption and political instability within a country are negatively associated with foreign direct investment (Mauro, 1995; Wei, 2000). Similar to Junior mineral companies (Maponga and Maxwell, 2000), some Independents appear to strategically target countries avoided by larger competitors (Section 5.6.6.). Indeed, as Delios and Heinsz (2003) found for Japanese manufacturers, experience in politically hazardous countries augments the propensity to internationally expand into further hazardous countries. Risk management strategies as expressed by Independent α, may be the source of this experiential competence.

Neglected by academic research, British Independent exploration and production companies act as a novel vehicle for exploring the organizational strengths and competitive strategies that can be deployed by smaller firms. In an industry shrouded by secrecy (Stevens, 1995), this thesis has aimed to demonstrate the necessity of fieldwork to challenge existing data frontiers. Adhering to a prescriptive theoretical framework (Bazerman, 2005), this thesis has aimed to show what the small firm can, rather than cannot do. The identified organizational strengths and competitive strategies used by Independents are unlikely to be restricted to the petroleum industry. Further research is necessary to test whether they may be applied to other Small and Medium sized enterprises in differing industries.

Appendix 1.1 - Bibliography

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Appendix 1.2

INDEPENDENT A

1. Strategic Decision-Making

A. OPERATOR

1.1 Answer all questions for the case of operator (Or alternatively majority partner)
Name your last successful exploration drilling
[Pass respondent show card 1.1]

Last Successful

Name 1

For the exploration undertaken please give the calendar dates of the following actions (mm/yy)

Date mm/yy

Licence block awarded..... _____
Drilling of the first unsuccessful test well commenced ..... _____
Drilling of the successful test well commenced ..... _____
Production on-line ..... _____

Number of appraisal wells..... _____
Offshore or Onshore (delete as appropriate) ..... Off / On
Water depth..... _____m
Depth of successful well..... _____m
To which State jurisdiction did the licence block pertain..... _____
What was this company's % shareholding in the block..... _____%

Please name below the % shareholdings of the other companies who held an interest in the block
Last Successful

Name (PRINT)	% Share
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

1.2
Following appraisal well drilling, for your last field development as operator, how long did it take to formulate the overall field development decision prior to submission for state approval?

_____

1.3
[Pass respondent show card 1.3]
For this field development decision please estimate the % of your total time spent on the following activities:

	%
Contracting negotiations	_____
Raising financial capital	_____
Reservoir studies	_____
Sales arrangements	_____
Other (please name)	_____

_____

[Pass respondent show card 1.4]

B. NON-OPERATOR

1.4 Answer all questions for the case of non-operator (Or alternatively minority partner)

Last Successful

Name your last successful exploration drilling — **Name 2**

For the exploration undertaken please give the calendar dates of the following actions (mm/yy)

Date mm/yy

Licence block awarded..... _____
Drilling of the first unsuccessful test well commenced ..... _____
Drilling of the successful test well commenced ..... _____
Production on-line ..... _____

Number of appraisal wells..... _____
Offshore or Onshore (delete as appropriate) ..... Off / On
Water depth..... _____m
Depth of successful well..... _____m
To which State jurisdiction did the licence block pertain..... _____
What was this company's % shareholding in the block..... _____%

Please name below the % shareholdings of the other companies who held an interest in the block

Last Successful Name 2

Name (PRINT)	% Share
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

1.5

Have you been an employee of a Major or SuperMajor in the past? Major A

Comparing your experience in Major A to current Independent A, for which particular operations do you notice there to be a differential in the decision-making speed?

Probes:

- internal consultations
- negotiating contracts
- drilling schedule
- resolving operating difficulties

1.6
[Pass respondent show card 1.6]
What factors stimulate your efforts most to reduce the time between award of licence and producing on-line? Please rank in order of importance, 1= most important and 6 = least important. Rank all alternatives and do not use tied ranks. If 'other' detailed, rank from 1 to 7.

	Rank
Cashflow.....	_____
Competitive advantage.....	_____
Cost of capital.....	_____
Government incentives.....	_____
Oil price expectations.....	_____
Production targets.....	_____
other (please name).....	_____

_____

1.7
[Pass respondent show card 1.7]
What factors hold you up most between award of licence and first test well drilling? Please rank in order of importance, 1= most important and 6 = least important. Rank all alternatives and do not use tied ranks. If 'other' detailed, rank from 1 to 7.

	Rank
Block significance relative to partner firms' total portfolio.....	_____
Delayed capital contribution by partner firm(s).....	_____
Delayed drilling by contracting firm(s).....	_____
Differing geological interpretations by partner firm(s).....	_____
Establishing a drilling contract.....	_____
Partner approval.....	_____
Other (please name).....	_____

_____

1.8
[Pass respondent show card 1.8]
When holding operator status, prior to the execution of a test-well drilling, could you please detail the departments and the positions of personnel that will be consulted within your company?
Probes:

- Strategic apex – top management (CEO, Board of Directors)
- Middle line – middle management (Country Manager, Commercial Manager)
- Operating core – workers (Team Leader, Drilling workers, Contractors)
- Technostructure – analysts and systems designers (Engineering Consultant)
- Support staff – providers of indirect services (Administration)

In total how many personnel will be consulted before the decision is made to execute the test-well drilling?

_____

1.9
Returning to Name 1 (last successful test well as Operator). What was the departmental position of the manager who made the final decision on whether to execute a test well drilling?

_____

How many licence blocks enter within the decision-making jurisdiction of this manager?

_____

1.10
[Pass respondent show card 1.10]
Please consider the following scenario.
A piece of test-well drill pipe has twisted off and requires recovery. The 'fishing' process is proving problematic. The choice is either to abandon the hole and leave the pipe as lost, or to hire a contractor with highly specialised retrieval machinery. The contractor's expertise may enable drilling to recommence on the original hole following their work. The contractor's charge is £ 2 million, the alternative of drilling a new test well beside the original is £10 million.

Please give the departments and the positions of personnel that would be consulted within your company to resolve this issue?
Probes:

- Strategic apex – top management (CEO, Board of Directors)
- Middle line – middle management (Country Manager, Commercial Manager)
- Operating core – workers (Team Leader, Drilling workers, Contractors)
- Technostructure – analysts and systems designers (Engineering Consultant)
- Support staff – providers of indirect services (Administration, Legal)

Please detail the approximate time it would take for the strategic decision making team to decide upon which course of action should be undertaken? _____

1.11
Out of your last 5 test wells (excluding appraisal & development) undertaken as Operator, how many made a commercially successful find? _____

1.12
What future production and reserves targets have you set?

2. Contracting Significance

2.1
For how many of your current blocks are production operators provided in-house? _____

2.2
[Pass respondent show card 2.2]
Tick the functions that are provided in-house and not contracted out.

Mark a letter 'M' beside those functions that are a mixture

Tick	Function	Tick	Function
1.	Commercial	14.	Pipe laying
2.	Data management	15.	Pipeline engineering
3.	Design & development engineering	16.	Pipes / pipe handling equipment
4.	Diving personnel / equipment / vessels	17.	Process engineering
5.	Drilling personnel	18.	Procurement
6.	Drilling equipment / vessels	19.	Project management
7.	Facilities management/ Prod' operations	20.	Reservoir engineering
8.	Finance	21.	Seismic analysis
9.	Health, safety, environment (HSE)	22.	Seismic survey
10.	Human resource management	23.	Software & system engineering
11.	Maintenance services	24.	Subsea design
12.	Mechanical engineering	25.	Subsea fabrication
13.	Petroleum engineering	26.	Other (please specify) .....

2.3
[Pass respondent show card 2.3]
Please rank the five contracting firms upon which the performance of your company is most dependent. Please also specify the function / service they provide to your company.

		Contracting Firm	Function / Service
Most dependent	1.	_____	_____
	2.	_____	_____
	3.	_____	_____
	4.	_____	_____
	5.	_____	_____

2.4
Name the contracted drilling operator with whom your firm has the strongest ties Contractor C.
[Pass respondent show card 2.4]
For your relationship with Contractor C please rate the importance of the following governance structures sought[1]. Tick one box for each characteristic.

Characteristic	Very important	Quite important	Indifferent	Of little importance	Not important
Information disclosure					
Penalties for premature termination					
Specialized dispute settlement mechanisms					
Verification mechanisms					
Other (please specify)					

[1]Note: a full explanation of these Governance Structure categories was given to each interviewee. The description provided followed that expressed in Section 5.4.2.1.

[Pass respondent show card 2.5]
For Contractor C please rate the following factors according to their influence on strengthening ties. Tick one box for each characteristic.

Characteristic	Very important	Quite important	Indifferent	Of little importance	Not important
Intended quality delivered					
On-time					
Within budget					
Other (please specify)					

2.5
In the last 5 years have you formed an alliance with a drilling and/or production operations contractor? Please specify the company(s) and the rationale.

Confidentiality – For the following two questions company identities will be treated with strict confidentiality. Firms will remain anonymous and will be referred to in my dissertation only as Company A, Company B, Company C etc.

2.6
Do any of your drilling contractors receive a % share of the total sales from the field?
Please specify the company(s) and % share received.

Contractor	%	Contractor	%
_____	____	_____	____
_____	____	_____	____
_____	____	_____	____

What alternative drilling contractor performance incentives do you incorporate?

3. Negotiation

Please name one country outwith Europe & North America where your company has applied for an exploration and/or production licence Country A

Please name one country within Europe or North America where your company has applied for an exploration and/or production licence Country B

[Pass respondent show card 3.1]
By reference to the list below, what factors most influence a licence being awarded in Country A?
Please answer by ranking the importance of the contributing factors, using the numbers 1 to 5 only where 1 is most important and 5 is least important. Rank all alternatives and do not use tied ranks.

By reference to the list below, what factors most influence a licence being awarded in Country B?
Please answer by ranking the importance of the contributing factors, using the numbers 1 to 5 only where 1 is most important and 5 is least important. Rank all alternatives and do not use tied ranks.

3.1 **Behavioural Factors**	Country A Rank		Country B Rank
Accessing the appropriate government official	____		____
Persistence	____		____
Seniority of company representatives	____		____
Presence of a host-country national among company representatives	____		____
Use of the same company representatives	____		____

[Pass respondent show card 3.2]
By reference to the list below, what factors most influence a licence being awarded in Country A?
Please answer by ranking the importance of the contributing factors, using the numbers 1 to 5 only where 1 is most important and 5 is least important. Rank all alternatives and do not use tied ranks.

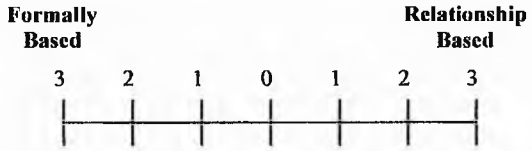
By reference to the list below, what factors most influence a licence being awarded in Country B?
Please answer by ranking the importance of the contributing factors, using the numbers 1 to 5 only where 1 is most important and 5 is least important. Rank all alternatives and do not use tied ranks.

3.2 **Technical Factors**	Country A Rank		Country B Rank
Geological assessment (e.g. new play idea, lead)	____		____
Level of commitment to drill (e.g. 'Firm' or 'Contingent' well)	____		____
Innovative application or development of technology	____		____
Rapidity of work programme	____		____
Financial capability	____		____

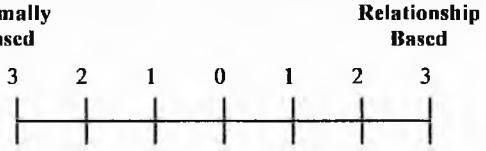
Confidentiality – For the following two questions both company identity and the countries referred to will be treated with strict confidentiality. Your firm will remain anonymous and will be referred to in my dissertation only as Company A; the countries as Country A, Country B.

3.3
Comparing Country A to Country B, in which country are behavioural factors of greatest influence?
Comparing Country A to Country B, in which country are technical factors of greatest influence?

3.4
[Pass respondent show card 3.4]
For Country A where on the spectrum between a formal approach and a relationship based approach does the licensing authority's selection procedure lie? Please circle the appropriate number on the scale below.



For Country B where on the spectrum between a formal approach and a relationship based approach does the licensing authority's selection procedure lie? Please circle the appropriate number on the scale below.



3.5
What advantages may smaller firm size confer when applying for an exploration licence in Western countries?
Probes:

- *Government policy – reduce market concentration*
- *NPV materiality*
- *bring new geological ideas*
- *speed of development*
- *focus*
- *application of technology – sweat the asset*

What disadvantages may smaller firm size confer when applying for an exploration licence in Western countries?
Probes:

- *availability of capital*
- *experience*
- *in-house capabilities*
- *dependence upon contracting firms*

What advantages may smaller firm size confer when applying for an exploration licence in non-Western countries?
Probes:

- *increased partnership opportunity*
- *seniority of company representatives*
- *communication facilitated*
- *cost conscious*

What disadvantages may smaller firm size confer when applying for an exploration licence in non-Western countries?
Probes:

- *prestige*
- *availability of capital*
- *experience*
- *in-house capability*
- *connections*

4. International Strategy

Has your company expanded abroad?
[Holds licences in two or more countries]
Yes – [questions 4.1 – 4.3]
No – [questions 4.4 – 4.5]

4.1	Year	Country
Please tell me the year and country of your:		
First Operating shareholding abroad	_____	_____
First Non-Operating shareholding abroad	_____	_____

What was the rationale for this company's first overseas licence block holding being undertaken as Operator / Non-Operator [delete as appropriate]?
Probes:

- *risk management*
- *opportunity*
- *availability of capital*
- *diversify portfolio*

4.2 When you first expanded overseas what was the rationale behind this action?
[Pass respondent showcard 4.2]

4.2

Please tick the appropriate variables

Tick	Rationale
☐	Company's oil/gas reserves expansion
☐	Diversify portfolio
☐	Higher return abroad
☐	Improved fiscal terms
☐	Increased cost of finding oil/gas in Country A relative to abroad
☐	Greater possibility of control (Operator)
☐	Greater potential of oil/gas areas abroad (Under-explored)
☐	Less competition abroad
☐	Lower monetary commitment required
☐	Proximity to market
☐	Utilise existing contacts
☐	Other (please detail) .....

From the variables you have ticked or detailed, please select the **one most important variable** and mark a star (*) beside it.

4.3 Do you seek to further increase your international operations?
What is the current rationale to this intention?
[Pass respondent showcard 4.3]

4.3a **YES**

What is the current rationale to this intention?
Please tick the appropriate variables

Tick	Rationale
☐	Company's oil/gas reserves expansion
☐	Diversify portfolio
☐	Higher return abroad
☐	Improved fiscal terms
☐	Increased cost of finding oil/gas in Country A relative to abroad
☐	Greater possibility of control (Operator)
☐	Greater potential of oil/gas areas abroad (Under-explored)
☐	Less competition abroad
☐	Lower monetary commitment required
☐	Proximity to market
☐	Utilise existing contacts
☐	Other (please detail) .....

From the variables you have ticked or detailed, please select the **one most important variable** and mark a star (*) beside it.

4.3b **NO**

What is the current rationale to this intention?
Please tick the appropriate variables

Tick	Rationale
☐	Administrative burden
☐	Already sufficiently diversified
☐	Beyond staff's experience
☐	Business model
☐	Geographical focus
☐	Insufficient contacts
☐	Potential of domestic oil/gas areas
☐	Risk involved
☐	Other (please detail) .....

From the variables you have ticked or detailed, please select the **one most important variable** and mark a star (*) beside it.

4.4 What is the rationale for this company not expanding abroad?
[Pass respondent showcard 4.4]

4.4
Please tick the appropriate variables

Tick	Rationale
☐	Administrative burden
☐	Already sufficiently diversified
☐	Beyond staff's experience
☐	Business model
☐	Geographical focus
☐	Insufficient contacts
☐	Potential of domestic oil/gas areas
☐	Risk involved
☐	Other (please detail) .....

From the variables you have ticked or detailed, please select the **one most important variable** and mark a star (*) beside it.

4.5
In the next 5 years does your company plan to expand abroad?
What is the current rationale to this intention?
[Pass respondent showcard 4.5]

4.5a **YES**

What is the current rationale to this intention?
Please tick the appropriate variables

Tick	Rationale
☐	Company's oil/gas reserves expansion
☐	Diversify portfolio
☐	Higher return abroad
☐	Improved fiscal terms
☐	Increased cost of finding oil/gas in Country A relative to abroad
☐	Greater possibility of control (Operator)
☐	Greater potential of oil/gas areas abroad (Under-explored)
☐	Less competition abroad
☐	Lower monetary commitment required
☐	Proximity to market
☐	Utilise existing contacts
☐	Other (please detail) .....

From the variables you have ticked or detailed, please select the **one most important variable** and mark a star (*) beside it.

4.5b **NO**

What is the current rationale to this intention?
Please tick the appropriate variables

Tick	Rationale
☐	Administrative burden
☐	Already sufficiently diversified
☐	Beyond staff's experience
☐	Business model
☐	Geographical focus
☐	Insufficient contacts
☐	Potential of domestic oil/gas areas
☐	Risk involved
☐	Other (please detail) .....

From the variables you have ticked or detailed, please select the **one most important variable** and mark a star (*) beside it.

4.6
Please explain your reason for choosing the following countries.
[Circle the primary reason given]

Country A?

Country B?

Country C?

Country D?

Appendix 1.3

University of St Andrews

Torcail M Stewart
MEIR M Phil Postgraduate
C.R.I.E.F.F. Centre for Research into Industry
Enterprise, Finance and the Firm

Mr Ed Story
Chief Executive Officer
SOCO International plc
Swan House
32/33 Old Bond Street
London
W1S 4QJ

21st November 2003

Dear Mr Story,

I am a postgraduate student at the University of St Andrews undertaking research for my M.Phil thesis on British Independent Oil and Gas exploration and production firms. To-date these firms have received little input from academia, most research being directed towards the workings of the larger Majors. My research aims to adjust this discrepancy by giving voice to the distinctive contributory features that Independents bring to the oil and gas industry. Particular areas of research focus include the speed of decision-making, the utilisation of contractors, and the deploying of successful internationalisation strategies. As my M.Phil is of an interdisciplinary nature, drawing on Management, Economics, and International Relations, I would hope that the tools of analysis drawn from these subjects, in combination, will provide valuable findings, not only for research purposes, but providing new support for the independent oil and gas sector.

To advance this research, I would appreciate conducting an interview of an hour or so with you, at a time you find most convenient. I hope the interview itself will be thought provoking and informative. Based on past experience many people find that being interviewed in this way stimulates fresh insights. The research intends to determine:

1. How organisational size and accompanying structure influence the speed at which decisions are executed
2. The rationale for the various contracting approaches adopted
3. The advantages that small firm size may confer in negotiation situations
4. The rationale supporting the international strategy undertaken

I attach the interview agenda. Following completion of my thesis, I will provide you with a summary report of my findings and conclusions. In terms of interview location, should you be away from your headquarters, my research allows me the flexibility to travel throughout the UK, and if necessary abroad. With respect to the interview, I enclose a basic data sheet, which it would be advantageous for you to complete before the interview.

Your participation in my research would be greatly appreciated. It will be invaluable to my postgraduate studies. I will be contacting you by telephone in the near future.

Yours sincerely,

Torcail M. Stewart
MEIR M.Phil Postgraduate

Enc: Agenda Outline
Basic Data Sheet

Department of Economics, St Salvator's College, St Andrews, Fife KY16 9AL, Scotland, U.K.
Tel: (01334) 425056 Mobile: 07754 509504 Email: tms5@st-andrews.ac.uk

Appendix 1.4

AGENDA OUTLINE

1. **Strategic Decision-Making**

   - Chronology of a successful exploration drilling
   - Factors hastening exploration
   - Factors delaying exploration
   - Influence of organisation structure upon decision-making speed

2. **Utilisation of Contractors**

   - In-house drilling and production operations
   - Contracted drilling and production operations
   - Governance structures sought
   - Alliance formation
   - Contractor incentivisation
   - Level of integration pursued

3. **Negotiation**

   - Influence of team management and behavioural factors
   - Influence of technical factors
   - Advantages of firm size

4. **International Strategy**

   - Rationale supporting first overseas expansion
   - Rationale supporting increases in international operations
   - Choice of region, country

Appendix 1.5

BASIC DATA

It would help if you could complete this before the interview. The data are probably contained in your firm's current documentation, so if it would save you time, I could transcribe the data if you could provide me with the documents. Many thanks for your cooperation.

1. Date firm established _____

2.Please name the principal Departments within your organisation or preferably send me a copy of your organisational chart._____

_____

3. Licence blocks where you are	Total No.	Countries
Operator	_____	_____
		_____
Non-Operator	_____	_____
		_____

4.	2001	2002
Annual Oil Production.....	_____ MMbbl	_____MMbbl
Annual Gas Production.....	_____MMscf	_____MMscf
Annual Total Production.....	_____MMboe	_____MMboe

5. Annual Total Production within the UKCS..... _____MMboe
Annual Total Production outside the UKCS..... _____MMboe

6.	2002
Capital expenditure on exploration activities	£m_____
Capital expenditure on development activities	£m_____

7.

Total loan capital.....	£m_____	
Bank loans and overdrafts due within one year....	£m_____	
Bank loans due after more than one year.....	£m_____	
Mezzanine Finance.....	£m_____	No. of Shares _____
Venture Capital.....	£m_____	No. of Shares _____

Type (e.g. Start-up, Development) _____ Investment timescale (duration) _____ years

8. Which variables do you hedge (please tick)	Oil Price ☐	Currency ☐	Interest Rates ☐
% of total MMboe hedged in 2002.....	_____%		
Average price per boe hedged.....	$_____		

9. Average price received per boe (excluding the effect of hedging) $_____

10. Please complete for those directly employed.	Headcount	Estimate Av. Salary/ Wage (£)
Total No. of employees.....	_____	
No. of employees in exploration and production division.....	_____	
No. of Directors	_____	_____
No. of Non-Exec Directors.....	_____	_____
No. of Technical staff (e.g. Seismic Analysts, Petroleum Engineers).....	_____	_____
No. of Support staff (Administrative, Legal, PR).....	_____	_____
No. of Managerial staff (e.g. Offshore Installation Managers, Drilling Supervisors)	_____	_____
No. of Specialist operators (e.g., Mud Loggers, Motor Men, Derrick Men).....	_____	_____
No. of Labourers (e.g. Roustabouts, Roughnecks).....	_____	_____

Appendix 1.6

CONTRACTOR A

1. Scope & Scale of Operations

1.1
Please complete for those directly employed: Headcount
Total No. of employees..... _____

1.2
Geographical scope of your operations:
Please name the countries in which your rigs are currently operating

_____
_____

1.3
Total No. of Countries..... _____
Primary country of operation..... _____

1.4 [Pass respondent show card 1.4]
Rigs owned by your company according to rig type

	Land Rig	Barge	Platform	Tender-Assisted Rig	Jackup (Self-elevating)	Semisubmersible (Moored)	Semisubmersible (Dynamically Positioned)	Drillship (Dynamically Positioned)
Tick	☐	☐	☐	☐	☐	☐	☐	☐
No. of rigs		.....	.....	.....	.....	.....	.....	.....

1.5
Total No. of Offshore rigs..... _____
Total No. of Onshore rigs..... _____

1.6 [Pass respondent show card 1.6]
Please estimate the proportion of your contracts undertaken with customers of the following sizes. Please detail in the box below.

Size of Operator		
Small (Independents)	*Medium* (Independents)	*Large* (Majors)
Ex: Venture, Paladin, Cairn	Ex: Kerr McGee, Apache, BG Group	Ex: ConocoPhillips, BP, Exxon
North Sea _____ %	North Sea _____ %	North Sea _____ %
Globally _____ %	Globally _____ %	Globally _____ %

1.7
On average, what is the typical NPV value of a contract that your firm is involved in?
£ _____m

1.8 [Pass respondent show card 1.8]
Please rate the five Operating firms upon which the performance of your company is most dependent.

		Operating Firm
Most dependent	1.	_____
	2.	_____
	3.	_____
	4.	_____
	5.	_____

1.9

Name the Operator with whom your firm has the strongest ties. _____

Why this Operator?

Probes:

- *Geographical*
    - *international operations*
    - *historic linkage*
- *Technical*
    - *demand for particular drilling technology*
- *Economic*
    - *high margins attained*
    - *no. of potential future contracts*

What factors have been influential in strengthening ties?

Probes:

- *Performance*
    - *intended quality delivered*
    - *on-time*
    - *within budget*
    - *HSE*
- *Frequency of Transaction*
    - *trust*
    - *mutual knowledge of practices*
- *Technical*
    - *specifications incorporated*

2. Design, Risk & Incentives

The following questions aim to evaluate your experience of contracts with Operator firms of differing size.

2.1
Comparing your experience of working for Independents relative to Majors, for which particular operations do you notice there to be a differential in the decision-making speed?
Probes:
Contract application procedure
- *duration of tendering*
- *finalising terms & conditions*

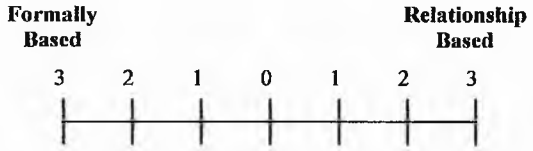
During drilling
- *Resolution of technical difficulties*

What do you believe to be the cause of this differential?
Probes:
Bureaucracy-
- *number of people consulted*
- *short chain of command (to the ultimate decision-maker)*
- *internal specifications*

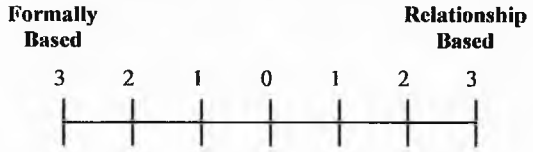
Experience –
- *inter-field knowledge of Operating personnel*

Tendering Approach –
- *on-line*
- *form filling vs. meetings based*
- *formal vs. relationship based*
- *trust*

2.2 [Pass respondent show card 2.2]
For Independents where on the spectrum between a formal approach and a relationship based approach does the contractual tendering selection procedure typically lie? Please circle the appropriate number on the scale below.



For Majors where on the spectrum between a formal approach and a relationship based approach does the contractual tendering selection procedure typically lie? Please circle the appropriate number on the scale below.



2.3
Could you tell me the smallest Independent for whom your company has provided drilling in the last 5 years.
<Independent A>

Could you tell me the largest Major for whom your company has provided drilling in the last 5 years.
<Major B>

2.4
Over-engineering (Over-specification)
Over-engineering in customers' requirements involves, being forced to adhere to company-specific specifications rather than using industry-wide ones. Whereby your firm is needed to supply to prescriptive company standards rather than functional ones. This over-specification often occurs in non-critical areas.

Comparing <Independent A> to <Major B> for which was a greater proportion of the total project cost attributed to **over-engineering (over-specification)**?

☐

2.5
Late Design Change
The degree of change in customers' requirements and specifications once work on a project had begun.

Comparing < Independent A > to < Major B > for which Operator was a greater proportion of the total project cost attributed to **late project design changes**?

☐

2.6
Comparing < Independent A > to < Major B > for which Operator was a greater proportion of the total project cost attributed to **late payment**?

☐

2.7
Comparing < Independent A > to < Major B > for which Operator was a greater proportion of the total project cost attributed to the Operator's **behavioural approach**?

☐

2.8
Comparing < Independent A > to < Major B > for which Operator were **standardised terms and conditions (equivalent to those set out by CRINE)** more closely followed.

☐

2.9
Comparing < Independent A > to < Major B > for which Operator was a greater proportion of the total **project risk** allocated to your firm?

☐

< Independent A >		**< Major B >**	
[Pass respondent show card 2.8a]		[Pass respondent show card 2.8b]	
How was this risk apportioned?		How was this risk apportioned?	
Please tick the appropriate boxes.		Please tick the appropriate boxes.	
Equity system (farm-in)	☐	Equity system (farm-in)	☐
% share of total field sales	☐	% share of total field sales	☐
Fixed price at outset (Turnkey)	☐	Fixed price at outset (Turnkey)	☐
Penalty system	☐	Penalty system	☐
Bonus system	☐	Bonus system	☐
If you have ticked Bonus system please select the performance measures that were incentivised through bonuses.		If you have ticked Bonus system please select the performance measures that were incentivised through bonuses.	
☐ Budget targets		☐ Budget targets	
☐ Health & Safety targets		☐ Health & Safety targets	
☐ Output targets		☐ Output targets	
☐ Quality target		☐ Quality target	
☐ Time targets		☐ Time targets	

2.10
Comparing Independents to Majors, for which size of Operator is a greater proportion of total **project risk** typically allocated to your firm?

☐

2.11
What contractor performance incentives has your firm engaged in?
Probes:
- *Equity system (farm-in)*
- *% share of total field sales*
- *Fixed price at outset (Turnkey)*
- *Penalty system*
- *Bonus system*

3. SWOT Analysis

3.1 [Pass respondent show card 3.1]
What are the **strengths** of undertaking a contract with an **Independent**?
Please rank in order of importance, 1= most important and 5 = least important. Rank all alternatives and do not use tied ranks. If 'other' detailed, rank from 1 to 6.

Acceptance of existing contractor specifications _____
Decisiveness (fast decision-making speed) _____
Ease of negotiation _____
Improved contractor bargaining power _____
Quality of management _____
Other (please name) _____

_____

Qualitative comment:

3.2 [Pass respondent show card 3.2]
What are the **weaknesses** of undertaking a contract with an **Independent**? Please rank in order of importance, 1= most important and 5 = least important. Rank all alternatives and do not use tied ranks. If 'other' detailed, rank from 1 to 6.

Cost consciousness _____
HSE approach _____
Length of contract (short) _____
Materiality of project (low) _____
Quality of management _____
Other (please name) _____

_____

Qualitative comment:

3.3 [Pass respondent show card 3.3]
What are the **opportunities** of undertaking a contract with an **Independent**? Please rank in order of importance, 1= most important and 4 = least important. Rank all alternatives and do not use tied ranks. If 'other' detailed, rank from 1 to 5.

Greater contractor autonomy _____
Greater trust in contractor _____
Higher margin _____
High possibility of contract renewal _____
Other (please name) _____

_____

Qualitative comment:

3.4 [Pass respondent show card 3.4]
What are the **threats** of undertaking a contract with an **Independent**? Please rank in order of importance, 1= most important and 4 = least important. Rank all alternatives and do not use tied ranks. If 'other' detailed, rank from 1 to 5.

HSE risk _____
Oil price feedback _____
Payment default _____
Technical error _____
Other (please name) _____

_____

Qualitative comment:

3.5 [Pass respondent show card 3.5]
What are the **strengths** of undertaking a contract with a **Major**?
Please rank in order of importance, 1= most important and 5 = least important. Rank all alternatives and do not use tied ranks. If 'other' detailed, rank from 1 to 6.

Financial security (payment) _____
HSE approach _____
Length of contract (long) _____
Materiality of project (high) _____
Quality of management _____
Other (please name) _____

_____

Qualitative comment:

3.6 [Pass respondent show card 3.6]
What are the **weaknesses** of undertaking a contract with a **Major**?
Please rank in order of importance, 1= most important and 5 = least important. Rank all alternatives and do not use tied ranks. If 'other' detailed, rank from 1 to 6.

Decisiveness (slow decision-making speed) _____
Ease of negotiation _____
High management turnover _____
Prescriptive engineering specifications _____
Reduced contractor bargaining power _____
Other (please name) _____

_____

Qualitative comment:

3.7 [Pass respondent show card 3.7]
What are the **opportunities** of undertaking a contract with a **Major**? Please rank in order of importance, 1= most important and 3 = least important. Rank all alternatives and do not use tied ranks. If 'other' detailed, rank from 1 to 4.

Drilling delay more acceptable _____
Greater willingness to spend _____
Possibility of several future contracts _____
Other (please name) _____

_____

Qualitative comment:

3.8 [Pass respondent show card 3.8]
What are the **threats** of undertaking a contract with a **Major**? Please rank in order of importance, 1= most important and 4 = least important. Rank all alternatives and do not use tied ranks. If 'other' detailed, rank from 1 to 5.

Intrusive supervision _____
Legalistic approach _____
Lower contractor autonomy _____
Operator's aversion to risk (risk transferred to contractor) _____
Other (please name) _____

_____

Qualitative comment:

4. Pricing, Technology & Competition

4.1
[Pass respondent show card 4.1]
Please consider the following scenario.
Your company has been contacted by two Operating firms, Firm A and Firm B. Both are requesting utilisation of a specific drilling rig held within your rig portfolio. Currently, this is the only rig available and able to meet the rapid timing constraints that Firm A and Firm B have set. Each firm has offered a contract of identical monetary value. Your choice is whether to accept the contract from either Firm A or Firm B.

Operating Firm Sizes
Firm A Market Cap = £1,000m
Firm B Market Cap = £100,000m

Which firm would you choose?
[Firm A / Firm B] (delete as appropriate)

What is the rationale supporting this choice?

4.2
Does your firm engage in differential pricing according to a customer's willingness to pay?
[Yes / No] (delete as appropriate)

Comparing Independents to Majors, with whom does your firm typically detect a greater willingness to pay for a given good or service?

☐

4.3
Does your firm engage in differential pricing according to Operator firm size?
[Yes / No] (delete as appropriate)

Comparing Independents to Majors, with whom does your firm typically achieve a higher price for a given good or service?

☐

4.4
Comparing Independents to Majors, during a period of **low** oil price with which size of Operator would you be more willing to undertake transactions with?

☐

Could you please give the reason for this choice.

4.5
Comparing Independents to Majors, during a period of **high** oil price with which size of Operator would you be more willing to undertake transactions with?

☐

Could you please give the reason for this choice.

4.7
Comparing Independents to Majors, by which size of Operator is more **sophisticated drilling technology** typically employed?

☐

4.8
Comparing Independents to Majors, by which size of Operator is more **expensive drilling technology** typically employed?

☐

4.9
Please give examples of the range of drilling technology typically utilised by Independents?
Probes:
- *Workover technology*
- *Directional Drilling – bit, mud motor, MWD tool (inclination + azimuth), driller collers, stabiliser*
- *Horizontal drilling of production wells*
- *CO_2 Injection*
- *Through-tubing rotary drilled (TTRD) wells*

4.10
Please give examples of the types of drilling technology typically only accessed by Majors?
Probes:
- *Workover technology*
- *Through-tubing rotary drilled (TTRD) wells*
- *Directional Drilling – bit, mud motor, MWD tool (inclination + azimuth), driller collers, stabiliser*
- *Horizontal drilling of production wells*
- *Wireline logging – log suites available.*
- *CO_2 Injection*

4.11 [Pass respondent show card 4.11]
Rank the following areas according to the level of competition there is between drilling rig suppliers to secure customers. Please rank according to the level of competition, 1= most competitive and 8= least competitive. Rank all alternatives and do not use tied ranks.

Offshore

Asia / Pacific	_____
Caspian Sea	_____
East Coast Africa	_____
Gulf of Mexico	_____
Latin America	_____
Middle East	_____
North Sea	_____
West Coast Africa	_____

4.12 [Pass respondent show card 4.12]
For the following areas, how does the level of competition between drilling rig suppliers to secure customers vary. Please rank according to the level of competition, 1= most competitive and 7= least competitive. Rank all alternatives and do not use tied ranks.

Onshore

Africa	_____
Asia / Pacific	_____
Europe	_____
Latin America	_____
Middle East	_____
Post-Soviet states	_____
US	_____

Appendix 1.7

AGENDA OUTLINE

1. **Scope and Scale of Operations**

   - Geographical range
   - Rig portfolio
   - Customer orientation

2. **Engineering Designs & Risk**

   - Operators' decision-making speed
   - Project management by Operators
   - Project risk allocation
   - Performance incentives

3. **SWOT analysis**

   - Independent E&P companies
   - Majors' E&P divisions

4. **Pricing, Technology & Competition**

   - Differential pricing
   - Oil price scenarios
   - Drilling technology utilised
   - Regional competition

Appendix 1.8

University of St Andrews

Torcail M Stewart
MEIR M Phil Postgraduate
C.R.I.E.F.F. Centre for Research into Industry
Enterprise, Finance and the Firm

Mr Per Johansson
Sr VP Technical & Operations
Dolphin Drilling Ltd
Howe Moss Drive
Dyce, Aberdeen
AB21 OGL

28th March 2004

Dear Mr Johansson,

I am a postgraduate student at the University of St Andrews undertaking research for my M.Phil thesis on British Independent Oil and Gas exploration and production firms. A fundamental element within this research is to examine the reliance of Independents upon Drilling Contractors. To-date this relationship has received little input from academia, most research being directed towards that involving the larger Majors. My research aims to adjust this discrepancy by giving voice to the distinctive contributory features that Independents bring to the oil and gas industry, and in particular, how this is manifested through their utilisation of drilling contractors. Areas of research focus include the differing behavioural approach adopted by Independent Operators towards contractors, the appropriateness of varying risk allocations, and the Strengths, Weaknesses, Opportunities and Threats (SWOT analysis) attributed to Operators of smaller firm size.

To advance this research, I would appreciate conducting a one-hour interview with you, at a time you find most convenient. I hope the interview itself will be thought provoking and informative. Based on past experience many people find that being interviewed in this way stimulates fresh insights. The research intends to determine:

1. How Operator size and accompanying structure influence the behavioural approach adopted towards contractors.
2. The appropriateness of varying risk allocations and whether these differ according to Operator size.
3. SWOT analysis for drilling contractors engaging with smaller Operators
4. Drilling technology employed by smaller Operators

(I attach the interview agenda.)

At all times confidentiality will be respected. No individual firm identities will be revealed. In terms of interview location, should you be away from your headquarters, my research allows me the flexibility to travel throughout the UK.
As my M.Phil is of an inter-disciplinary nature, drawing on Management, Economics, and International Relations, I would hope that the tools of analysis drawn from these subjects, in combination, will provide valuable findings, not only for research purposes, but for providing new support for the working association between Independents and Drilling Contractors

Following completion of my thesis, I will provide you with a summary report of my findings and conclusions. This will include feedback from the CEOs and Technical Directors of British Independents whom I have already interviewed.

Your participation in my research would be greatly appreciated. It will be invaluable to my postgraduate studies. I will be contacting you by telephone in the near future.

Yours sincerely,

Torcail M. Stewart
MEIR M.Phil Postgraduate

Enc: Agenda Outline

Department of Economics, St Salvator's College, St Andrews, Fife KY16 9AL, Scotland, U.K.
Tel: (01334) 425056 Mobile: 07754 509504 Email: tms5@st-andrews.ac.uk

Appendix 1.9 - Postal Questionnaire

INFORMATION SHEET

Return Address
Torcail M. Stewart
MEIR M.Phil Postgraduate
Department of Economics
St Salvator's College
St Andrews
Fife KY16 9AL
Scotland, UK.

Contact Details
Tel: +44 (0)1334425056
Mob: +44 (0)7754509504
E-mail: tms5@st-andrews.ac.uk

1.1
Following appraisal well drilling, for your last field development as operator, how long did it take to formulate the overall field development decision prior to submission for state approval?

_____

1.2
For this field development decision please estimate the % of your total time spent on the following activities:

	%
Contracting negotiations	
Raising financial capital	
Reservoir studies	
Sales arrangements	
Other (please name)	

_____

1.3
What factors stimulate your efforts most to reduce the time between award of licence and producing on-line? Please rank in order of importance, 1= most important and 6 = least important. Rank all alternatives and do not use tied ranks. If 'other' detailed rank from 1 to 7.

	Rank
Cashflow.....	
Competitive advantage.....	
Cost of capital.....	
Government incentives.....	
Oil price expectations.....	
Production targets.....	
other (please name).....	

_____

1.4
What factors hold you up most between award of licence and first test well drilling? Please rank in order of importance, 1= most important and 6 = least important. Rank all alternatives and do not use tied ranks. If 'other' detailed rank from 1 to 7.

	Rank
Block significance relative to partner firms' total portfolio.....	
Delayed capital contribution by partner firm(s).....	
Delayed drilling by contracting firm(s).....	
Differing geological interpretations by partner firm(s).....	
Establishing a drilling contract.....	
Partner approval.....	
Other (please name).....	

_____

2.1 Do you seek to further increase your international operations?
If **yes** please go to question 2.2
If **no** please go to question 2.3

2.2 **YES**
What is the current rationale behind this intention?
Please tick the appropriate variables

Tick	Rationale
	Company's oil reserves expansion
	Diversify portfolio
	Higher return abroad
	Improved fiscal terms
	Increased cost of finding oil/gas in US relative to abroad
	Greater possibility of control (Operator)
	Greater potential of oil/gas areas abroad
	Less competition abroad
	Lower monetary commitment required
	Proximity to market
	Utilise existing contacts
	Other (please detail) .....

From the variables you have ticked or detailed, please select the **one most important variable** and mark a star (*) beside it.

2.3 **NO**
What is the current rationale behind this intention?
Please tick the appropriate variables

Tick	Rationale
	Administrative burden
	Already sufficiently diversified
	Beyond staffs' experience
	Business model
	Geographical focus
	Insufficient contacts
	Potential of domestic oil/gas areas
	Risk involved
	Other (please detail) .....

From the variables you have ticked or detailed, please select the **one most important variable** and mark a star (*) beside it.

Appendix 1.9 - Postal Questionnaire

3.1
- For your company **tick** the functions that are provided in-house and not contracted out.
- Mark by an '**M**' those functions that are a mixture (i.e. sometimes in-house; sometimes contracted out)
- Mark by an '**O**' those that are exclusively contracted out.

Tick	Function	Tick	Function
1.	Commercial	14.	Pipe laying
2.	Data management	15.	Pipeline engineering
3.	Design & development engineering	16.	Pipes / pipe handling equipment
4.	Diving personnel / equipment / vessels	17.	Process engineering
5.	Drilling personnel	18.	Procurement
6.	Drilling equipment / vessels	19.	Project management
7.	Facilities management/ Prod' operations	20.	Reservoir engineering
8.	Finance	21.	Seismic analysis
9.	Health, safety, environment (HSE)	22.	Seismic survey
10.	Human resource management	23.	Software & system engineering
11.	Maintenance services	24.	Subsea design
12.	Mechanical engineering	25.	Subsea fabrication
13.	Petroleum engineering	26.	Other (please specify) .....

3.2
Please detail the function/ service provided by the contracting firm upon which the performance of your company is most dependent.

_____

3.3
What drilling contractor performance incentives do you utilise? Please tick the appropriate boxes.

Equity system (farm-in)
Fixed price at outset (Turnkey)
Bonus system
% share of total field sales
Penalty system

If you have ticked Bonus system please select the performance measures that are incentivised through bonuses.
Budget targets Health & safety targets Output targets Quality target Time targets

4.1
By reference to the list below, what factors most influence a licence being awarded in the USA?
Please answer by ranking the importance of the contributing factors, using the numbers 1 to 5 only where 1 is most important and 5 is least important. Rank all alternatives and do not use tied ranks.

	USA	<Country B>
Behavioural Factors	Rank	Rank
Accessing the appropriate government official		
Persistence		
Seniority of company representatives		
Presence of a host-country national among company representatives		
Use of the same company representatives		

What factors most influence a licence being awarded in <Country B>?
Please answer by ranking the importance of the contributing factors, using the numbers 1 to 5 only where 1 is most important and 5 is least important. Rank all alternatives and do not use tied ranks.

Comparing USA to <Country B> in which country are behavioural factors of greatest influence? _____

4.2
For USA where on the spectrum between a formal approach and a relationship based approach does the licencing authority's selection procedure lie? Please circle the appropriate number on the scale below.

Formally Based 3 - 2 - 1 - 0 - 1 - 2 - 3 **Relationship Based**

For <Country B> where on the spectrum between a formal approach and a relationship based approach does the licencing authority's selection procedure lie? Please circle the appropriate number on the scale below.

Formally Based 3 - 2 - 1 - 0 - 1 - 2 - 3 **Relationship Based**

END OF INFORMATION SHEET. THANK YOU FOR YOUR HELP
PLEASE POST TO ADDRESS AT TOP PAGE ONE

Appendix 1.10

University of St Andrews

Torcail M Stewart
MEIR M Phil Postgraduate
C.R.I.E.F.F. Centre for Research into Industry Enterprise, Finance and the Firm

Mr C. Howard Murrish
Executive Vice President - Exploration
McMoran Exploration Co.
1615 Poydras Street
New Orleans
LA 70115
USA

20th March 2004

Dear Mr Murrish,

I am a postgraduate student at the University of St Andrews undertaking research for my M.Phil thesis on US and British Independent Oil and Gas exploration and production firms. To-date these firms have received little input from academia, most research being directed towards the workings of the larger Majors. My research aims to adjust this discrepancy by giving voice to the distinctive contributory features that Independents bring to the oil and gas industry. Particular areas of research focus include the speed of decision-making, the utilisation of contractors, and the deploying of successful internationalisation strategies. As my M.Phil is of an interdisciplinary nature, drawing on Management, Economics, and International Relations, I would hope that the tools of analysis drawn from these subjects, in combination, will provide valuable findings, not only for research purposes, but also for providing new support for the independent oil and gas sector.

To advance this research, I would appreciate if you could complete the enclosed two-page information sheet, which should only take 9 minutes. Based on past experience, many respondents have found the topics covered, and the methods of answering them a stimulus to further examining, and better understanding, their own procedures. Questions are categorised by colour, and relate to the following research areas:

Red - How organisational size and accompanying structure influence the speed at which decisions are executed
Green - The rationale supporting the international strategy undertaken
Purple - The utilisation of contractors relative to firm size
Blue - Behavioural factors required for successful negotiations

At all times confidentiality will be respected. No individual firms' identities will be revealed, and conclusions reached are based on average tendencies for the sample as a whole, rather than specific cases.

Following completion of my thesis, I will provide you with a summary report of my findings and conclusions. This will include feedback from the CEOs and Technical Directors of British Independents whom I have already interviewed.

Your participation in my research would be greatly appreciated. It will be invaluable to my postgraduate studies.

Yours sincerely,

Torcail M. Stewart
MEIR M.Phil Postgraduate

Enc: Information Sheet
Return Envelope

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